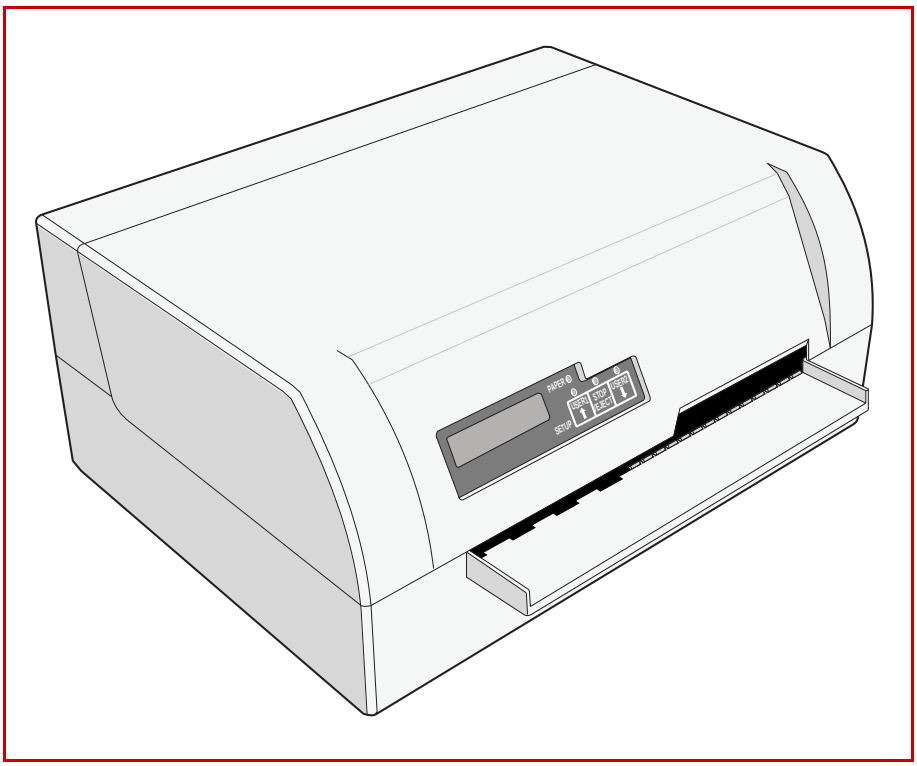
TallyGenicom®

5040

User Guide

Flatbed Printer



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Introduction

Printer features

This printer is a document printer for printing manually inserted documents as well as passbooks (vertical and horizontal fold passbooks). Manual insertion of the documents is supported by an automatic document alignment function.

The printer has a high processing speed and compact design. The 24-needle print head guarantees excellent print quality.

Different factory installed models can be delivered: MSR (magnetic stripe read/writer), scanner and second serial interface.

Interfaces

The basic printer model is provided with three interfaces: serial (RS-232C), parallel (IEEE1284) and USB 2.0 (Full speed). A special printer version has a second serial (RS-232C) interface.

Emulations

As standard, the printer is delivered with three emulations: EPSON ESC/P, IBM 4722 + PP XL24e, Olivetti PR2e, PR50 and PR2845.

Symbols used

Important information is highlighted in this manual by two symbols.

CAUTION highlights information which must be observed in order to prevent injuries to the user and damage to the printer.

NOTE highlights general or additional information about a specific topic.

About this manual

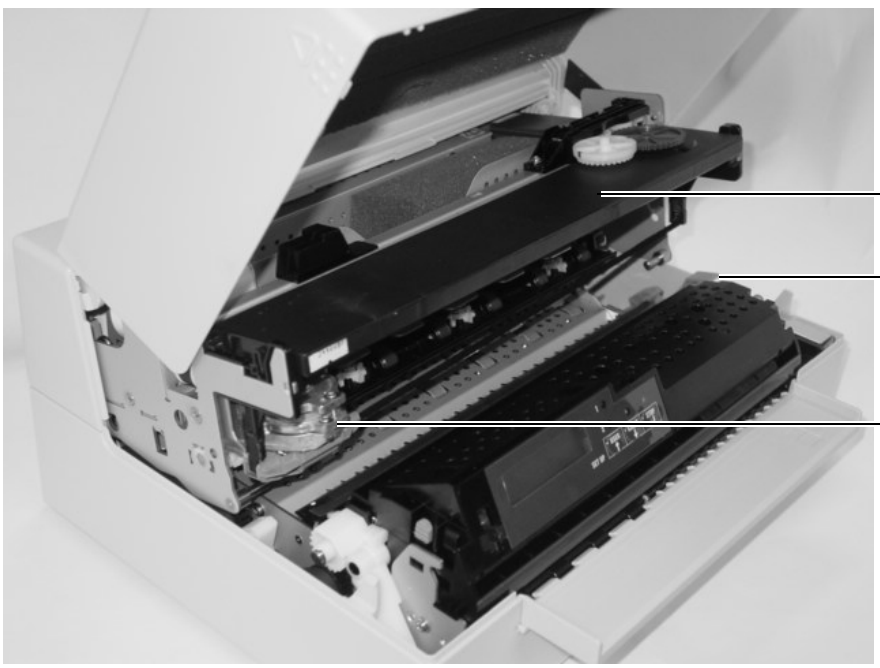
This user guide contains a detailed description of the printer, its characteristic features and additional information.

- Chapter 1 *Printer at a glance* lists all the parts of the printer.
- Chapter 2 *Installation* contains start-up instructions and points to note.
- Chapter 3 *Printer drivers and firmware* provides instructions for installing the printer driver.
- Chapter 4 *Control panel* explains how to control printer operations.
- Chapter 5 *Print media* tells you how to load, transport and eject media.
- Chapter 6 *Changing the ribbon cassette* explains how to remove and install a ribbon cassette.
- Chapter 7 *Replacing the print head* explains how to remove and install a print head.
- Chapter 8 *Menu* contains all the information necessary for controlling the printer via the control panel.
- Chapter 9 *Troubleshooting* provides instructions for rectifying faults which do not require the intervention of qualified personnel.
- Chapter 10 *Care and maintenance* provides information on the upkeep of the printer and contains important information in case the printer has to be transported.
- Appendix A *Specifications* informs you about the technical specifications of your printer and the paper which should be used.
- Appendix B *Character sets* lists the available character sets.
- Appendix C *Emulations* deals with programming via the interface.
- Appendix D *Interfaces* explains the interfaces.
- Appendix E *Consumables and accessories* contains information about consumables and accessories which can be purchased for your printer.

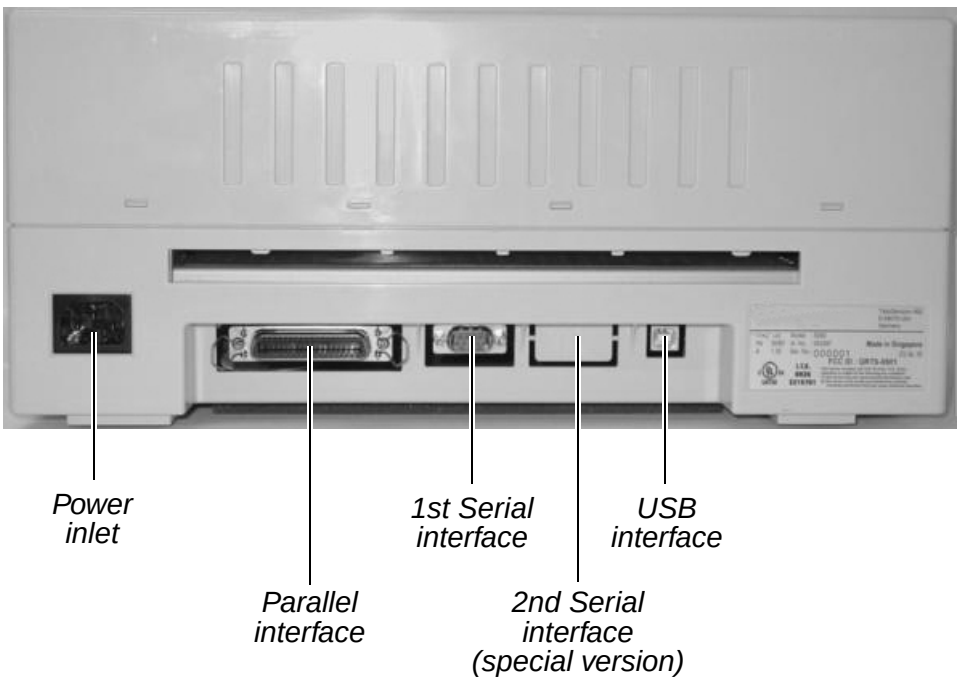
1 Printer at a glance

View from the front

View with cover opened



View from the rear



2 Installation

Unpacking the printer

Place your packaged printer on a solid base.

Make sure that the “Up” symbols is pointing up.

Open the packaging, lift the printer out of the cardboard box and remove the remaining packaging material.

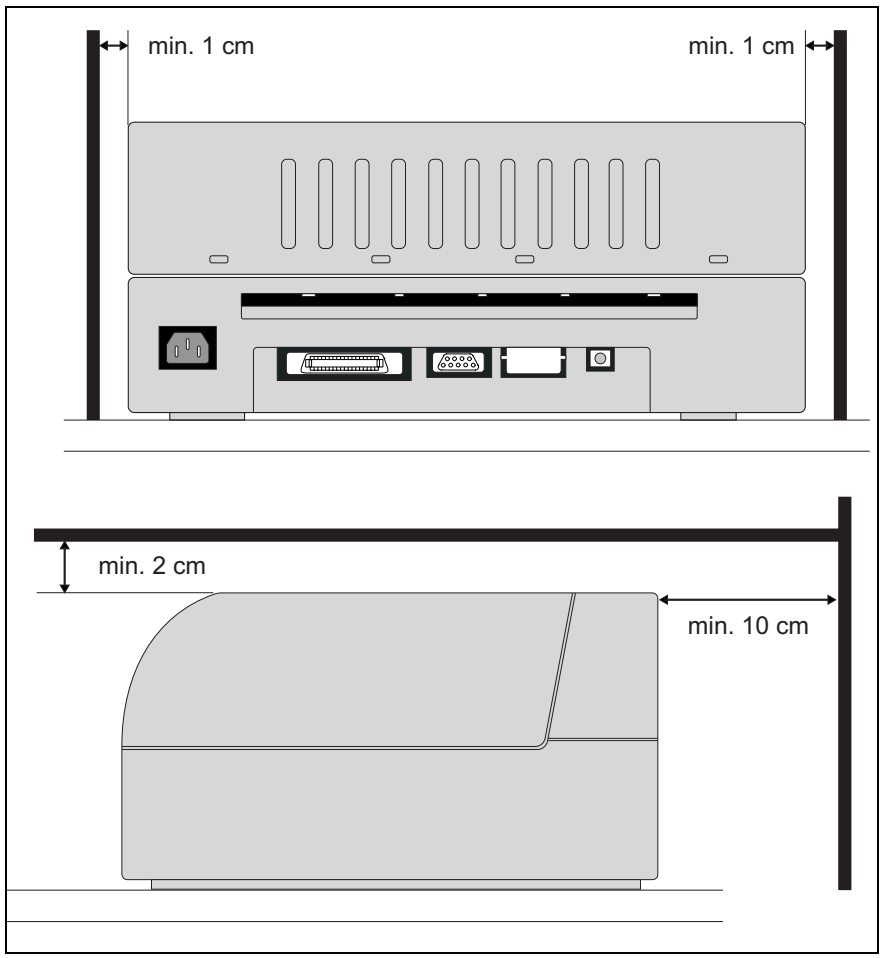
Check the printer for any visible transport damage and missing items. The following items should be enclosed:

- The Quick start guide (QSG)
- This CD-ROM (at the back of the Quick start guide)
- The power cable
- The ribbon cartridge

If you find any transport damage or if any accessories are missing, please contact your dealer.

Placing your printer

Place the printer on a solid, flat, surface, ensuring that the printer is positioned in such a way that it can not topple, and that there is easy access to the control panel and paper input tray. Also ensure there is sufficient space for the printed output.



Location		Minimum space
Left and right side of the printer		1 cm
Top of the printer		2 cm
Rear of the printer	to ensure sufficient ventilation	10 cm
	to print on a DIN A4 sheet	12 cm

STOP

The power supply cable may be damaged if the paper edges constantly chafe the insulating sheath. The user must always ensure that there is sufficient distance between the power supply cable and the paper.

When selecting the printer location, observe the following additional instructions:

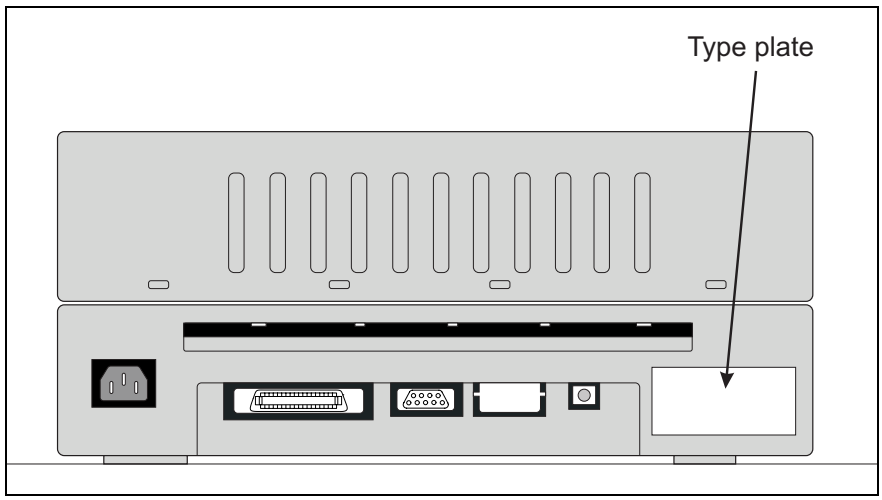
Never place the printer in the vicinity of inflammable gas or explosive substances.

- Protect the printer from shock, impact and vibration.
- Be sure to connect the printer to a socket with the correct mains voltage.
- Do not expose the printer to direct sunlight. If you cannot avoid placing the printer near a window, protect it from the sunlight with a curtain.
- When connecting the computer with the printer, make sure not to exceed the permitted cable length (see *Interface specifications*, page 87).
- Ensure sufficient distance between the printer and any heating radiators.
- Avoid exposing the printer to extreme temperature or air humidity fluctuations. Take care to avoid the influence of dust.
- Always disconnect the system from the mains before opening the device to perform maintenance work or remedy errors.

Checking the printer voltage

Make sure that the device has been set to the correct voltage (e.g. 230 V in Europe, 120 V in the USA). To do this, check the type plate at the back of the printer. Contact your dealer if the setting is incorrect.

STOP **Never switch on the printer if the voltage setting is incorrect, since this may result in severe damage to the printer.**



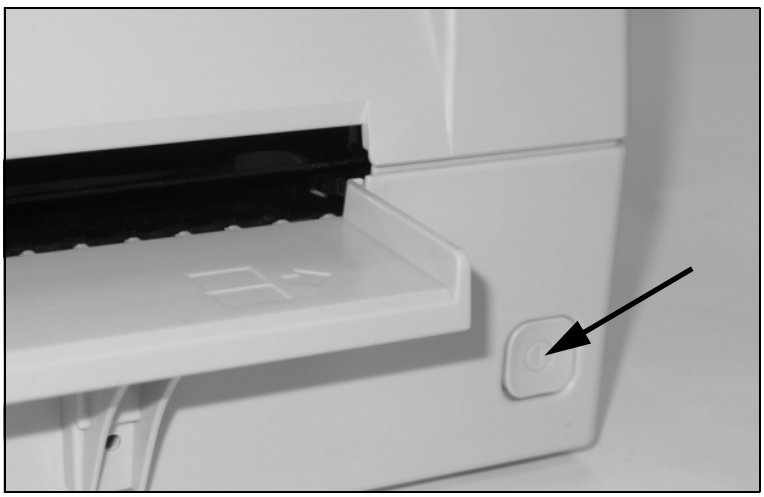
Connecting the printer

Connect the power cable to the power inlet of the printer. Connect the power cable plug to a mains socket.

Make sure that the printer and the computer are switched off and connect the data cable between the printer and the computer. This example shows a 36-pin centronics parallel cable.

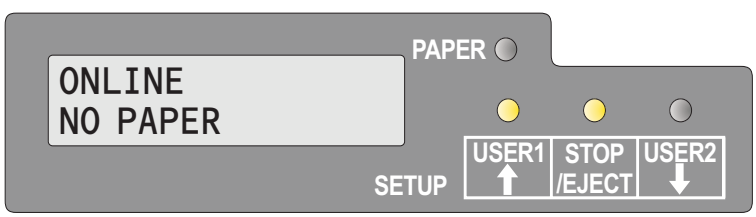
Switching on the printer

Before switching the printer on, make sure that it is connected correctly and that you have followed all the safety and installation instructions (see section *Placing your printer*, page 6).



Press the power switch which is located at the front bottom right of the printer to switch on the printer.

The printer initializes.



When initialization is completed, the Ready indicator and the USER 1 indicator light up. The message **ONLINE NO PAPER** appears on the LCD. The printer is in the online status and ready to accept data from the system. You can now insert a document or passbook.

3 Printer drivers and firmware

Printer drivers

You must install a printer driver so that the printer can process the data from your application programs.

An original driver offers the best conditions for optimal printing results. All available Windows printer drivers can be found on the CD-ROM en-closed with the printer, and also from our *Internet site*, from which you can download updated versions as required.

The use of any Windows printer driver from the CD-ROM requires that the printer is set to Epson emulation (see *Menu parameters*, page 57 and chapter *Emulations*, page 107).

Installing a printer driver in Windows 95/98

To install the printer driver, proceed as follows.

1. Insert the supplied online CD-ROM in the CD-ROM drive.
2. Click on the **Start** button in the Windows taskbar.
3. Move the mouse to **Settings** and click on **Printer** to open the printer folder.
4. Click on **New Printer**.
5. Click on **Next** In the Printer Installation Wizard.
6. Specify whether you want to operate the printer as a Local Printer or Network Printer by clicking on the relevant option, then press **Next**.

For instructions on installing the printer as a network printer, please consult the documentation supplied with your network operating system and/or printer server, or contact the network administrator.

7. Click on **Disk**, then on **Browse**.
8. Select the CD-ROM drive and open the directory **n:\english\drivers\<printer model>\win9x** ("n" stands for the letter of your PC drive).
9. Open the folder of your printer's operating system, select the file **oemsetup.inf** and click on **OK**.
10. Select the printer type. Click on **OK**, then on **Next**.

11. Select the port to which your printer is connected, then click on **Next**.
12. If required, edit the name of the default printer and specify whether you wish to use the printer as a default printer by clicking on the relevant option. Then click on **Next**.
13. Specify whether you wish to print a test page by selecting the relevant option and click on **Finish**. The printer driver will now be installed.

Installing a printer driver in Windows 2000/XP

The online CD-ROM contains printer drivers for the most common Windows applications. To install the printer driver, proceed as follows.

1. Insert the supplied online CD-ROM in the CD-ROM drive.
2. Click on the **Start** button in the Windows taskbar.
3. Click on **Printers and Faxes** to open the printer folder.
4. Click on **File** and **Add Printer** in the menu bar.
5. Click on **Next** In the Printer Installation Wizard.
6. Specify whether you want to operate the printer as a **Local Printer** or **Network Printer** by clicking on the relevant option, then press **Next**.

For instructions on installing the printer as a network printer, please consult the documentation supplied with your network operating system and/or printer server, or contact the network administrator. To install a network printer, you will need Administrator rights.

If you are using the printer locally, you can continue installing the driver in one of two possible ways:

- Manual installation of printer driver: in this case, continue with Step 7.
- Automatic installation of printer driver via Plug & Play function: in this case, continue with Step 12 once the printer installation wizard has determined the printer, port and printer name.

7. Select the port to which your printer is connected, then click on **Next**.
8. Click on **Data Carrier**, then click on **Browse**.
9. Select the CD-ROM drive and open the directory **n:\english\drivers\<printer model>\win2000** ("n" stands for the letter of your PC drive).

10. Open the folder of your printer's operating system, select the file **OEMPRINT.inf** and click on **OK**.
11. Select the printer type. Click on **OK**, then on **Next**.
12. If required, edit the name of the default printer and specify whether you wish to use the printer as a default printer by clicking on the relevant option. Then click on **Next**.
13. If you are using the printer as a network printer, you have the option of sharing it with other network users. In this case you must enter an access name which will be displayed to the other network users. Then click on **Next**.
14. Specify whether you wish to print out a test page by selecting the relevant option and click on **Finish**. The printer driver will now be installed.

Other operating systems

The printer can also be used with other operating systems such as Linux or Unix. In this case, set the printer to the EPSON or IBM Proprinter emulation for which default drivers are available in most operating systems.

Changing printer settings

You can make permanent changes to the printer settings using the control panel of the printer (see chapter *Menu*, page 45). Various printer settings can also be entered in the operating system of your PC, however.

1. Click on the **Start** button in the Windows taskbar.
2. *Windows 95/98:* move the mouse to **Settings** and click on **Printers** to open the printer folder.
   Windows 2000/XP: click on **Printers and Faxes** to open the printer folder.
3. Move the mouse pointer to the appropriate printer symbol, press the right mouse key and click on **Properties**.

Details of the settings available in this window can be found in the Windows documentation or help pages.

Settings entered in the printer driver via Windows have priority over settings entered via the printer menu.

Form settings (Windows 2000/XP)

In contrast to Windows versions 95/98, in which forms are defined in the printer driver itself, Windows versions 2000/XP have a central facility for managing form properties and assign one paper feed only.

If you want to set up a form not included in the Windows default settings, proceed as follows.

You will need Administrator rights to define new forms.

1. Click on the **Start** button in the Windows taskbar.
2. Click on **Printers and Faxes** to open the printer folder.
3. In the menu bar, click on **File** and **Server Properties**.
4. In the window Printer Server Properties, click on **Form** if necessary.
5. Either select an existing form from the Forms list or activate the option **New Form**.
6. Enter a form name and the desired values.
7. Click on **Save** to save the new form.

You can now assign this form to the paper feeds of your printer (see *Changing printer settings*, page 13).

The form cannot be assigned if its dimensions exceed the permissible paper sizes of the specified paper feed.

Loading firmware

The most current version of the firmware can be downloaded from our *Internet site*. There you will find also additional informations regarding the firmware and printer upgrades. Make sure that the download consists of the following files:

- Standard Model PB Flash VX.XX.exe: the memory writer (flash)
- BL_XXXX.IPL: Bootblock of the printer
- FWXXXX.mfw: Main firmware of the printer
- PBCGXXXX.BIN: Character generator (EU/US)

You can select the standard character generator (CG) or four optional character generators. Every optional CG provides the standard fonts and one additional font:

Standard CG	Optional CG 1	Optional CG 2	Optional CG 3	Optional CG 4
Draft	Draft	Draft	Draft	Draft
Draft Banking	Draft Banking	Draft Banking	Draft Banking	Draft Banking
Roman	Roman	Roman	Roman	Roman
Courier	Courier	Courier	Courier	Courier
Sans Serif	Sans Serif	Sans Serif	Sans Serif	Sans Serif
Gothic	Gothic	Gothic	Gothic	Gothic
OCR-A	OCR-A	OCR-A	OCR-A	OCR-A
OCR-B	OCR-B	OCR-B	OCR-B	OCR-B
–	Prestige Elite	Script	Orator	Bold

Interface

You can use the serial, the parallel or the USB interface to download the firmware to the printer.

Make sure that the selected interface is not connected to another printer.

Serial interface

Make sure that the serial interface is selected in the printers menu for User 1 and that the settings for Baudrate and Protocol on printer and PC are identical.

Parallel interface

Make sure that the parallel interface is selected in the printers menu for User 1, that in the PCs BIOS the parallel port is set to ECP and that the parallel cable meets the IEEE1284 standard.

USB interface (Windows2000/XP)

Make sure that the USB interface is selected in the printers menu for User 1, that a printer driver has been installed and the printer is defined as default printer.

Downloading firmware to the printer

To load new firmware to the printer, proceed as follows. As mentioned before it is important that no other device (printer) is set to the interface you want to use for the download.

Click therefore **Start** > **Control Panel** > **Printers and Faxes** and check that no printer is set to the port you want to use. E.g. if you want to use the serial interface RS232 no printer may have connected to the COM1 port.

1. Browse to the folder where the firmware files are stored.
2. Double-click the **Standard Model PB Flash VX.XX.exe** file.
3. On the **Memory Writer** screen select the interface (in our example serial port).
4. Make sure that the settings for port, baudrate, parity bit and stop bit are correct.
5. Select **IPL FIRMWARE** from **Download Type**.
6. Click **Browse** and select the BL_XXXX.IPL file.
7. Click **FLASH NOW**; the download process starts.
   When the download process is finished, the printer performs an initialization
8. Repeat step 5 to 7 for the FWXXX.mfw file and the PBCGXXXX.BIN file.

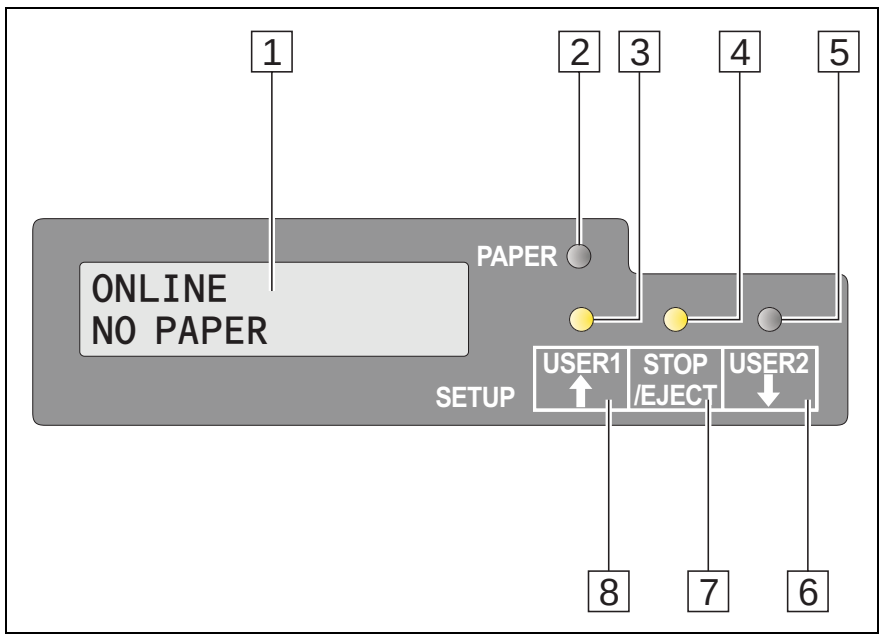
4 Control panel

The control panel allows the user to set some functions in the printer and set up the basic printer parameters on installation. The control panel is located on the front right side of your printer and consists of a two-line LC display with 2 x 16 digits, three keys for controlling the printer functions and four LED indicators displaying the status of the printer.

The functions of the keys depend on the printer's current mode (status). There are three basic modes.

- The Online mode is the printer's normal operating mode. Data from your computer can be received and printed.
- In the Offline (STOP) mode the link between printer and computer is interrupted, i.e. no data can be received and printed.
- In the Menu mode printer settings (line spacing, size of the interface buffer etc.) can be changed and saved permanently.

Display, indicators and keys



1 **LCD display**: Displays the internal printer status, operating instructions and error messages.

2 **Paper LED**: Indicates whether paper is loaded; on = paper is inserted, off = no paper inserted; blinking = indicates that data has been sent to the printer.

3 **User 1 LED**: Blinks if the printer is receiving data via the first interface, lights if a job is printed (see below).

4 **Ready LED**: Indicates Offline or Online status; on = online, off = offline; blinking = indicates that an error has occured, the cause of the error is indicated in the display.

5 **User 2 LED**: Blinks if the printer is receiving data via the second interface, lights if a job is printed (see below).

6 **USER 2 key**: Activated by application only; the functionality of the key depends on the emulation and the application used (see also User 2 LED).

7 **STOP/EJECT key**: Sets the printer to Online/Offline mode (see also Ready LED); ejects inserted paper (see also Paper LED).

8 **USER 1 key**: Activated by application only; the functionality of the key depends on the emulation and the application used (see also User 1 LED).

Please be aware that some emulations and applications may use the LEDs and keys in an entirely different way defined by the emulation and/or host software and outside the definitions contained in this document.

Status indicators

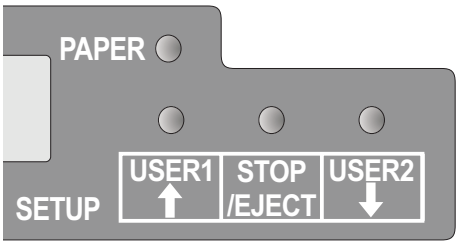
Status indicator variations

This section defines the status of the control panel. The LED lights will be on, off or blinking coupled with messages from the LCD. In this way the printer reports its current status.

Ready	Paper	User 1	User 2	LCD	Indicated Printer Status
off	off	—	—	STOP NO PAPER	Offline, no paper loaded
off	off	on	—	LOAD PAPER	Offline, printer waiting for paper as it has received data from the host (if data + Print Start command are transferred from Host)*
off	off	—	on	LOAD PAPER	Offline, printer waiting for paper as it has received data from the host (If data + Print Start command are transferred from Host)*
on	off	on	—	LOAD PAPER	Online, paper required (If data + Print Start command are transferred from Host)*
on	off	—	on	LOAD PAPER	Online, paper required (If data + Print Start command are transferred from Host)*
on	on	—	—	ONLINE PAPER	Online, paper is loaded
on	off	—	—	ONLINE NO PAPER	Online, no paper is loaded
blink	blink	—	—	xxxxx xxxxx	Error. The cause of the error is displayed on the LCD
—	—	on	off		Printer is under User 1 control
—	—	off	on		Printer is under User 2 control

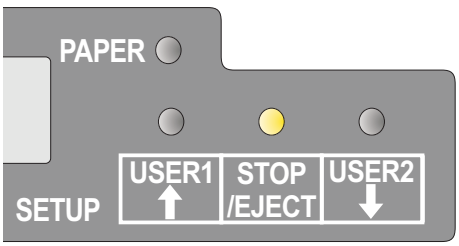
* applies to EPSON/IBM emulation only

Ready indicator (STOP LED)



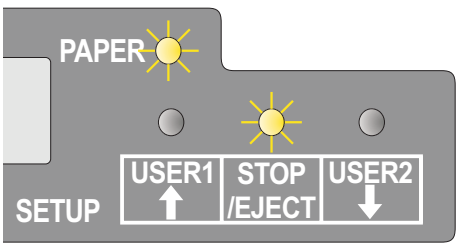
Ready indicator (STOP LED) not lit:

- The printer is in the stop status (Offline) and will not receive data from the system.



Ready indicator (STOP LED) lit:

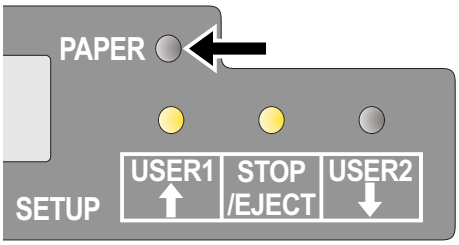
- The printer is switched on in the online status. It is ready to receive data from the system.



Ready (STOP LED) and Paper indicators (PAPER LED) blink:

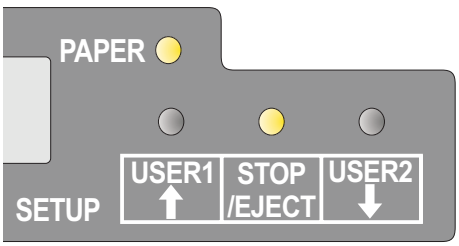
- The printer is not ready. A device error has occurred. Any data transferred from the system is deleted. The cause of the error is indicated on the LCD.

Paper indicator (PAPER LED)



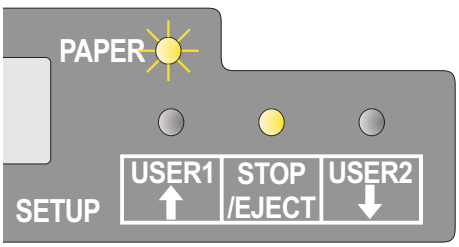
Paper indicator (PAPER LED) does not light:

- No paper is inserted in the printer.



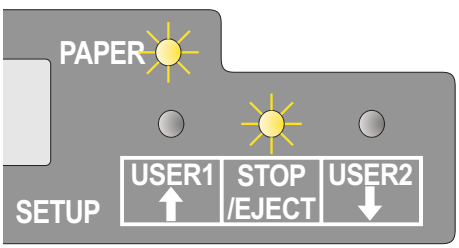
Paper indicator (PAPER LED) lights:

- Paper is inserted in the printer.



Paper indicator (PAPER LED) blinks:

- Paper required: The system has transferred data to the printer but there is no document or passbook inserted into the document support.



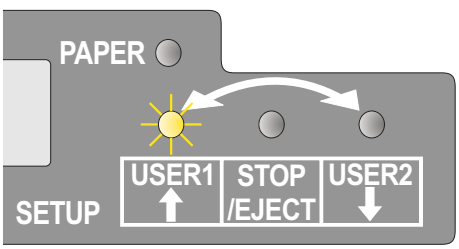
Ready (STOP LED) and Paper (EJECT LED) indicators blink:

- The printer is not ready. A device error has occurred. Any data transferred from the system is deleted. The cause of the error is indicated on the LCD. If paper is loaded, it will be ejected.

User 1 and User 2 indicators

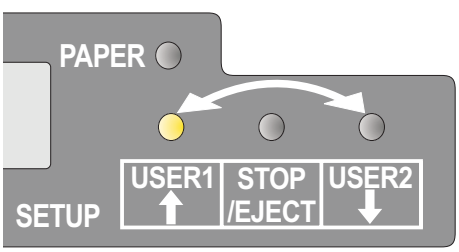
The USER 1 and USER 2 LEDs are normally under the control of the application. They are available to indicate to the user that the appropriate interface is active. Normally in Olivetti, IBM or Epson (Auto)emulations, with dual host connections they will indicate that a job is available for the interface associated with the USER. In Epson Emulation (Manual mode) they are lit under the control of the printer to indicate the availability of a job for process: the job can be released by inserting paper and pressing the associated key.

However please be aware that some applications may uses the LEDs and keys in an entirely different way defined by the host software and outside the definitions contained in this document.



The User 1 or User 2 indicator blinks:

- User 1 (interface 1) or User 2 (interface 2) receives data.

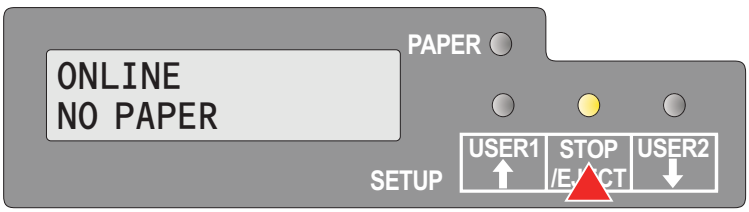


The User 1 or User 2 indicator lights:

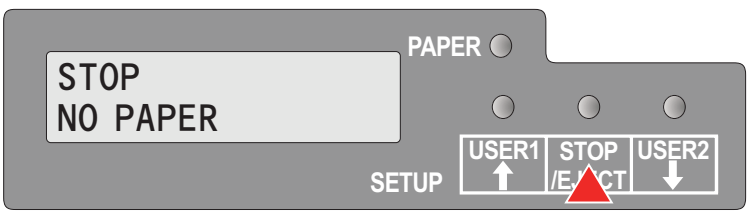
- User 1 (interface 1) or User 2 (interface 2) processes data.

Key functions during operation

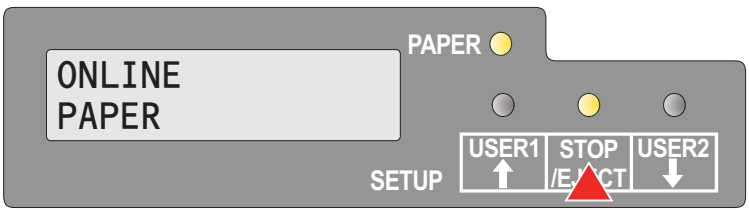
STOP/EJECT key



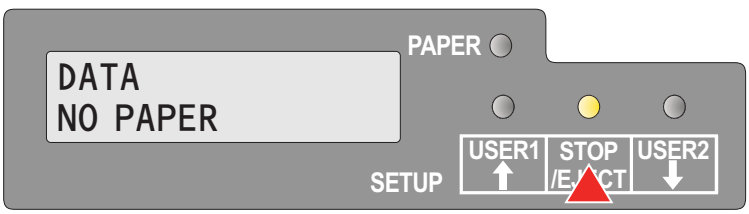
With the Ready indicator lit, the printer is ready to recieve data from the host. You can switch the printer from online to offline by pressing the **STOP/EJECT key**.



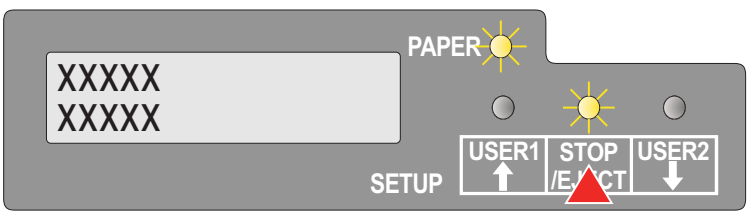
When the Ready indicator is not lit, the printer is Offline and will not receive data. Press the **STOP/EJECT key** to switch the printer On-line. Alternatively if paper is still in the printer when in the Off-lLine condition, the paper will be ejected.



If paper is loaded when the printer is online (Ready and Paper indicator lit), by pressing the **STOP/EJECT key**, the document will be ejected, the LCD displays **REMOVE PAPER**. The printer remains online.



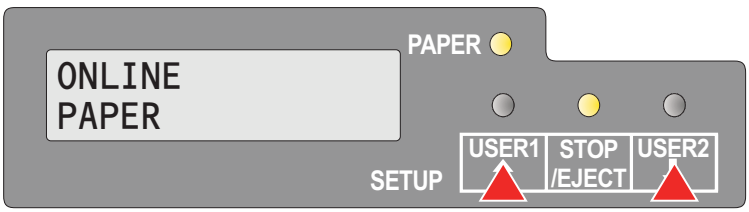
When the printer is online and the Paper indicator is off and there is data in the printer buffer, the LCD displays **DATA/NO PAPER**. You can switch the printer from online to offline by pressing the **STOP/EJECT key**.



When the Ready and Paper indicators blink, an error has occured. Annotate the displayed message in the LCD display. By pressing the **STOP/EJECT key**, paper will be ejected if loaded.

If the error message doesn't disappear after pressing **STOP/EJECT key**, power the printer off and on again. If the error consists, contact your customer support.

USER 1 and USER 2 key

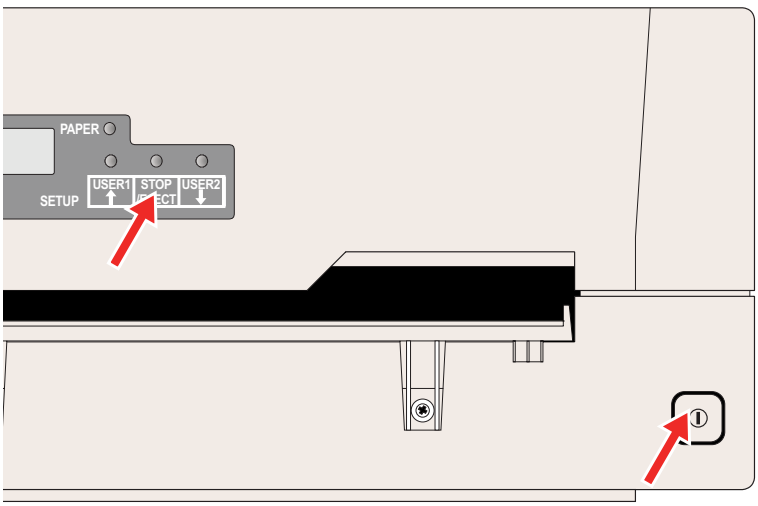


The **USER 1** and **USER 2 keys** are by default inactive. They must be activated via an application. The functionality of the keys then depend on the selected emulation and the sequences sent to the printer.

For more information on emulations and sequences please refer to the programmer's application manual.

Key functions when powering on

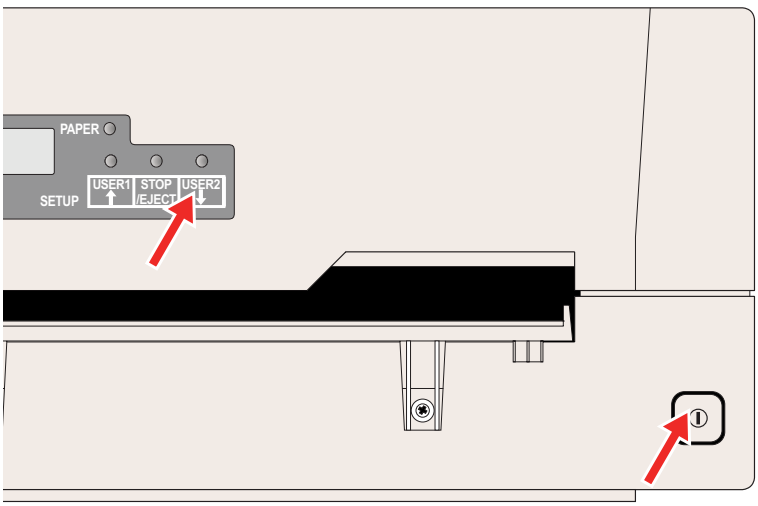
STOP/EJECT key



Powering on the printer whilst holding the **STOP/EJECT key** will activate "Hex Dump" mode. Keep the STOP pressed until the message **Hex Dump NO PAPER** appears on the LCD display.

Refer to the section *Hex Dump*, page 63, for a description of how to activate/deactivate and perform the test printout.

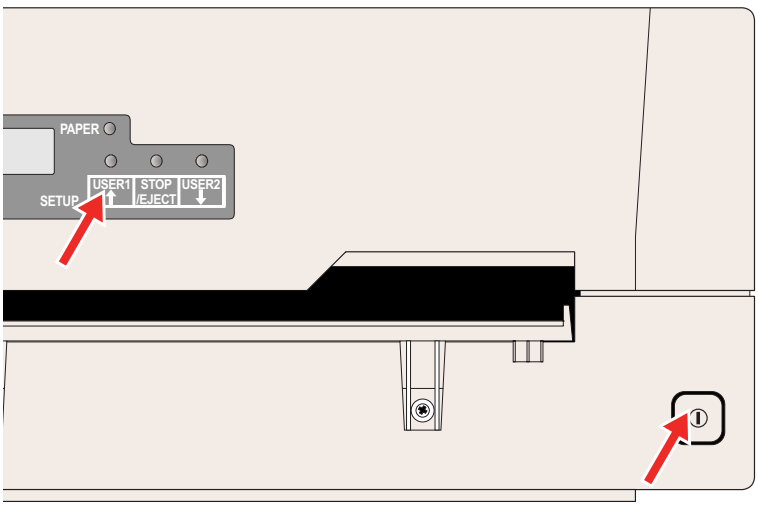
USER 2 key



Powering on the printer whilst holding the **USER2 key**, and subsequently loading paper on instructions from the LCD panel will allow you to make a status print. This is a print of all the parameter settings. Keep the USER2 key pressed until the message **Print StatusPage Load Paper** appears on the LCD display.

Refer to the section *Printing out the status page*, page 53, for further details on the status page.

USER 1 key



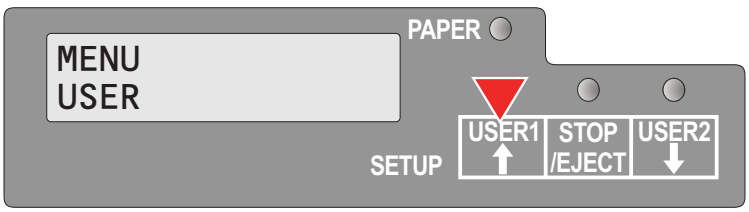
Powering on the printer whilst holding the **USER1 key** will allow you to enter menu mode. Keep the USER key pressed until the message **MENU USER** appears on the LCD display.

Refer to the section *Menu parameters*, page 57, for further details on the menu mode.

Key functions in menu mode

In menu mode the control panel keys have the following functions

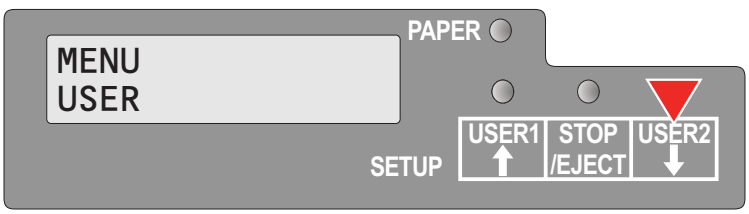
USER 1 key



The **USER1 key** is used to go to the next parameter group or next parameter on the same menu level (symbolized by an arrow pointing upwards).

It is also used to change parameter settings. For further details refer to the section *Menu handling*, page 47.

USER 2 key

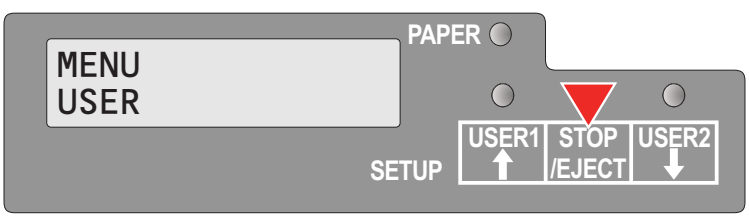


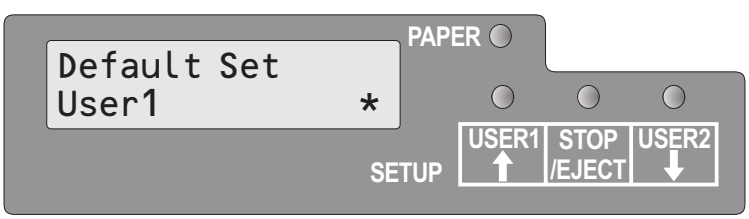
The **USER2 key** is used to go to the next parameter group or next parameter on the same menu level (symbolized by an arrow pointing downwards).

It is also used to change parameter settings. For further details refer to the section *Menu handling*, page 47.

STOP/EJECT key

In menu mode the **STOP/EJECT key** has the following functions:





The **STOP/EJECT key** is used to select the next menu level (e.g. **MENU USER** > **Default Set User 1**), to open a parameter item for changing and to confirm changed parameter items.

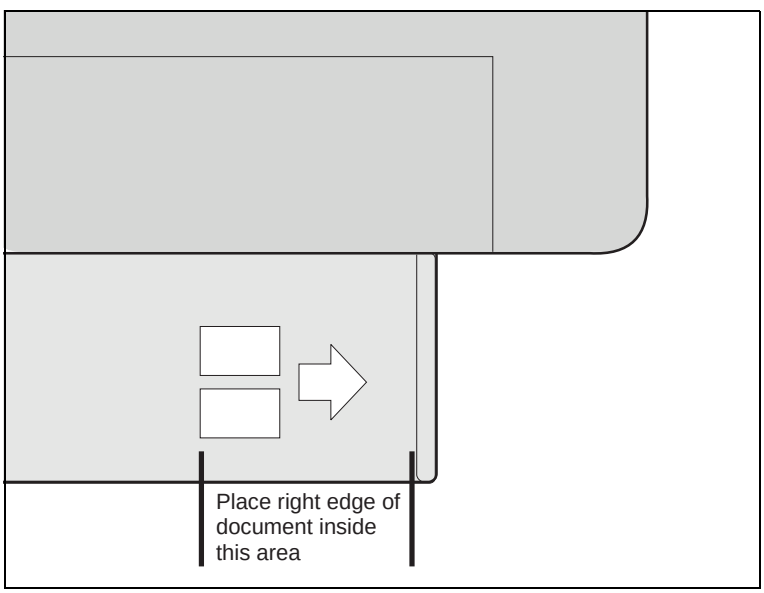
For further details refer to the section *Menu handling*, page 47.

5 Print media

Inserting a document

Before inserting a document make sure that the printer is switched on and the the message **ONLINE NO PAPER** is displayed in the LCD (see *Switching on the printer*, page 10).

Insert the document in such a way that the right paper edge is positioned inside the area between the left side of the symbol and the right edge of the document support, so that the document alignment can grasp it securely. This is especially important for documents that are narrower than a A4 sheet.



Then push the document towards the stop into the document chute.

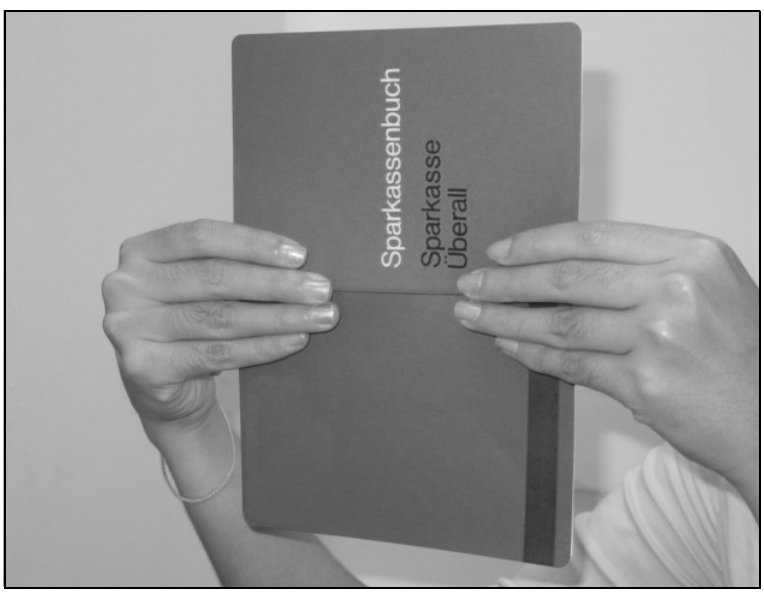
When the document is drawn in, the message **ONLINE PAPER** appears in the LCD.

When printing is completed, the document is transported out of the printer and released for removal. The message **ONLINE NO PAPER** appears on the LCD again.

Inserting a passbook

Before processing a new vertical-fold or horizontal-fold passbook, you should eliminate the stiffness of the fold by proceeding as follows.

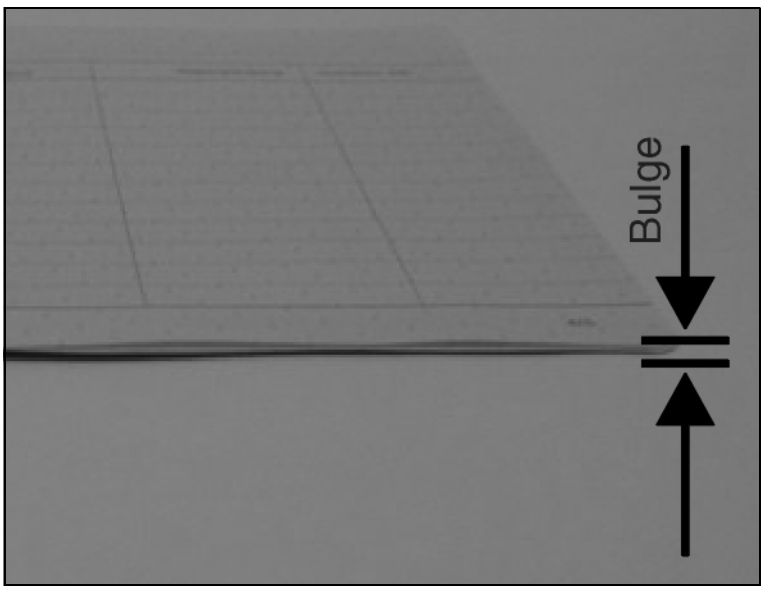
Open the passbook on the page that you want to print. Bend the fold backwards extremely hard.



Stroke along the fold of the passbook with both thumbs and index fingers and slightly bend the passbook outwards. To print a new passbook, repeat this procedure several times.

STOP

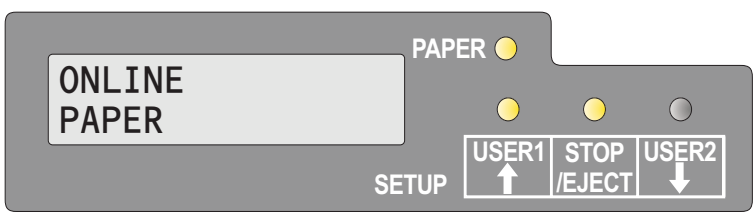
If the passbook has a magnetic stripe, take care not to crease or damage it in any way.



The bulge of the opened passbook should be as flat as possible to ensure trouble-free transportation into the paper.

Place the passbook on the right-hand side of the document support with the page to be printed facing up. The passbook must be entered into the opening of the chute. Once in the chute the printer mechanism will take the book. At this point you may release the book, as the printer will align it against it's right stop position and load it into the printer.

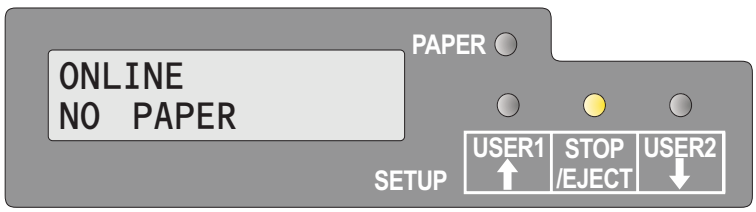
If the automatic document alignment cannot properly grasp stiff or bent passbooks, you should place the passbook manually at the edge of the right side of the document support and insert it.



When the passbook is inserted, the message **ONLINE PAPER** is displayed on the LCD.

Do not use passbooks that are outside of the specifications listed in the section *Paper specifications*, **page 85.** **The passbooks and the print head may be damaged.**

After the passbook is printed, it should be automatically ejected from the printer and released for removal. If the passbook has not successfully ejected from the printer, press the **STOP key** to to take the printer to STOP (Offline) mode: press the **STOP key** again to eject the passbook.

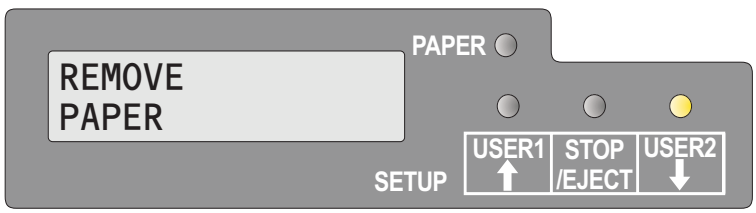


The message **ONLINE NO PAPER** appears on the LCD again.

Removing media

Paper can be ejected from STOP/Offline mode by pressing the **STOP/EJECT key**.

If the printer is Online, you must first first press the **STOP/EJECT key** to take the printer to STOP/Off line mode. Then press **STOP/EJECT key** again. The LCD displays the message:



You can now remove the media from the paper tray.

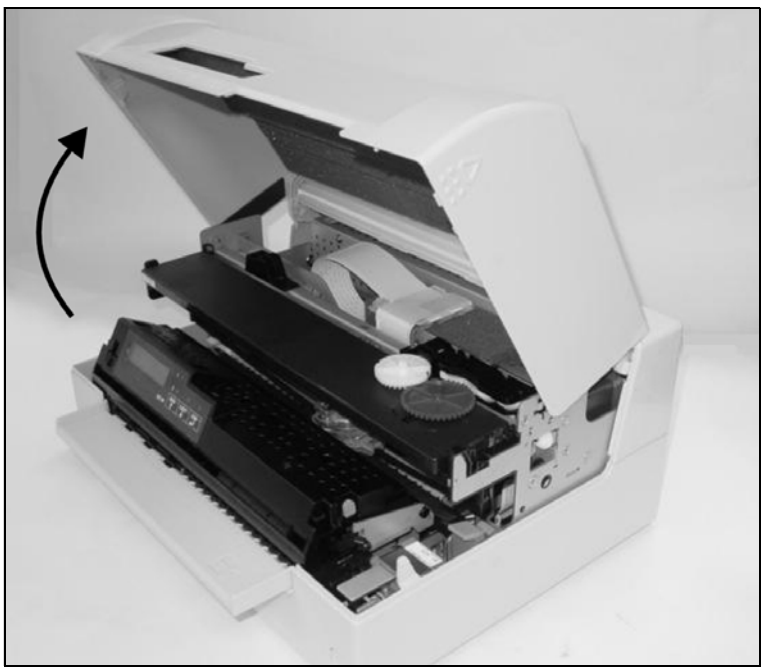
If a paper jam occurs please refer to the section *Clearing paper jams*, **page 74.**

6 Changing the ribbon cassette

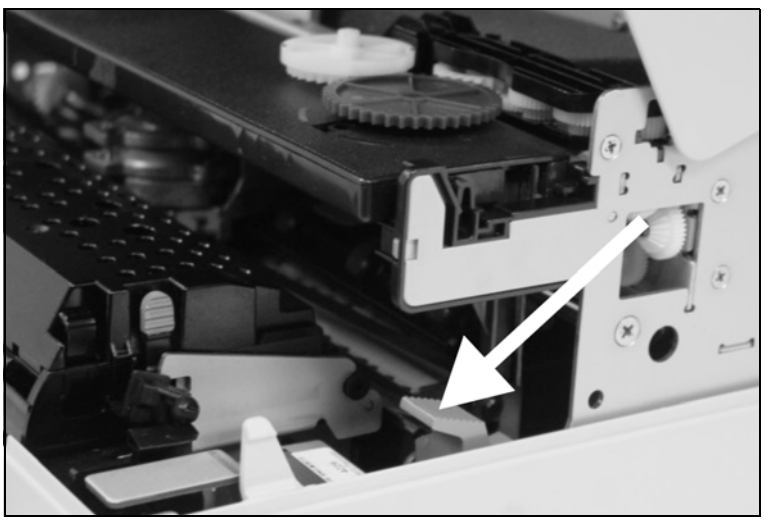
Make sure that the printer is switched off before replacing the ribbon cassette.

STOP **The print head may be hot if the printer has been printing for a long time. Wait until it cools to a temperature safe for handling.**

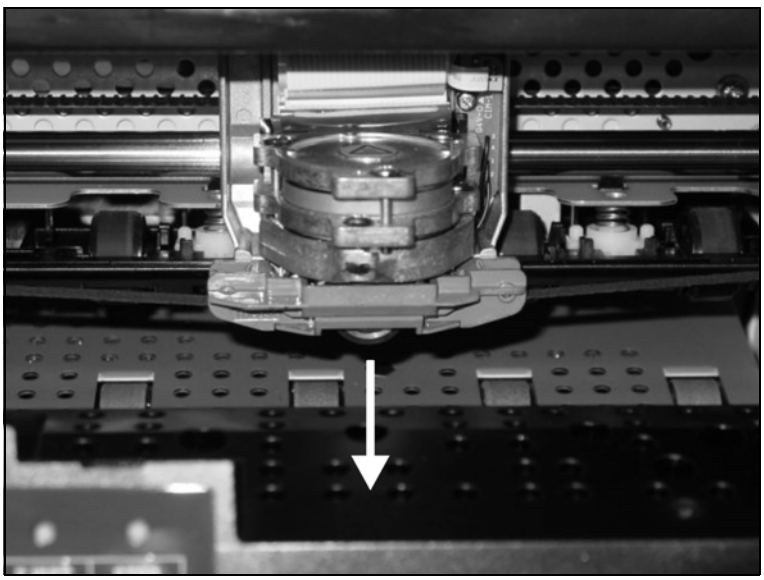
Removing the ribbon cassette



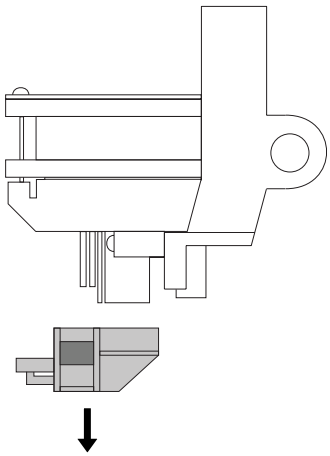
Open the top cover by grasping it at the right and left-hand sides and swing upward until it clicks into position.



Press the green release lever in the printing mechanism. This will swing the printing mechanism backwards.



Remove the colored ribbon guide from the print head by pulling it downwards.



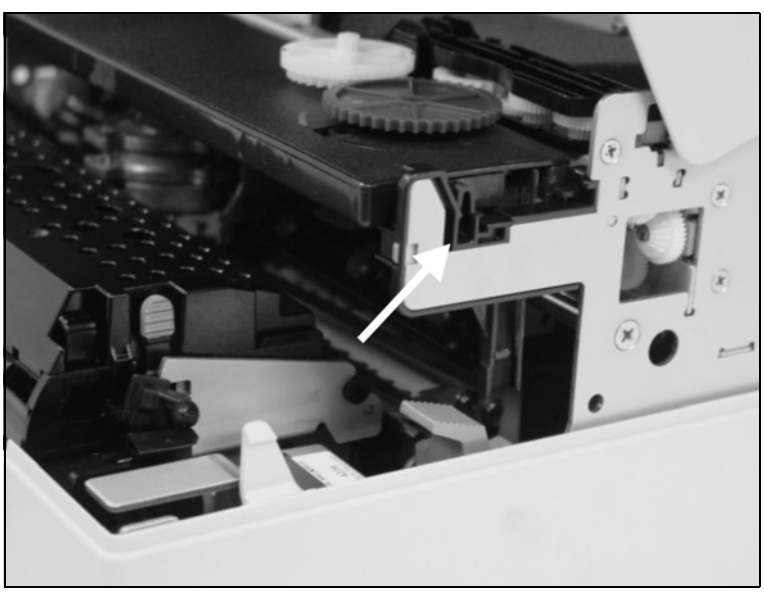
Raise the front end of the ribbon cassette on both sides. Take the ribbon cassette out of the printer.

Ensure proper disposal of used ribbon cassettes in accordance with the applicable national laws and regulations.

Inserting the ribbon cassette

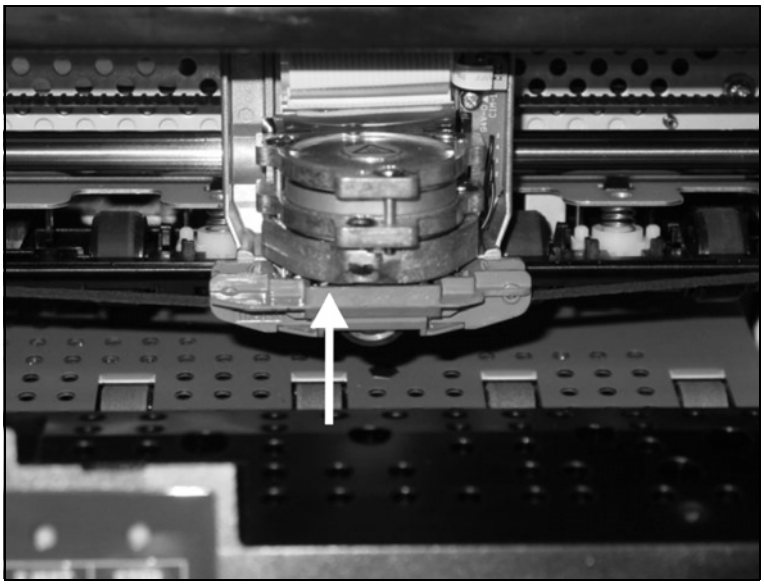
Take the new ribbon cassette from the packaging and remove the transportation lock which fixes the ribbon guide to the cassette.

First insert the new ribbon cassette by hooking it into the rear slots of its mountings.



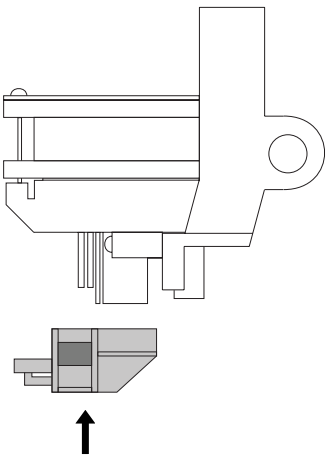
Push the front of the cassette into its mounting so that it clicks into position.

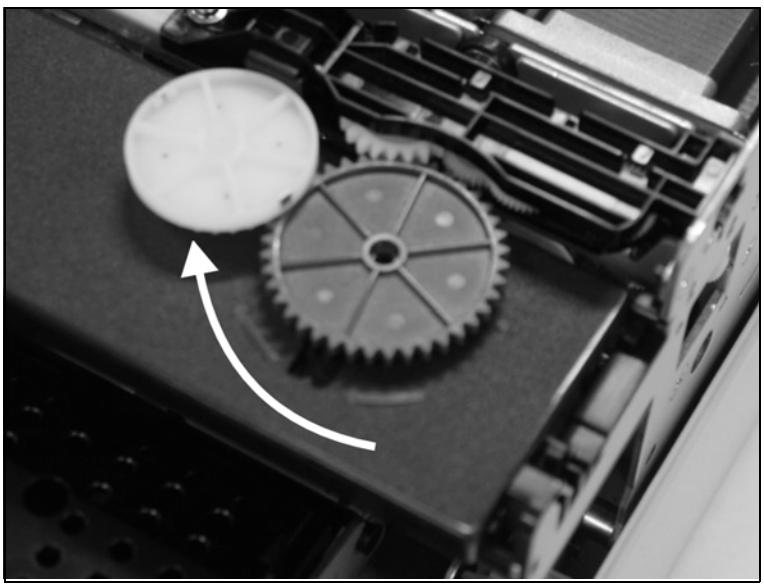
Please do not press the center of the ribbon cassette as this will deform the ribbon cassette and will cause operation problems.



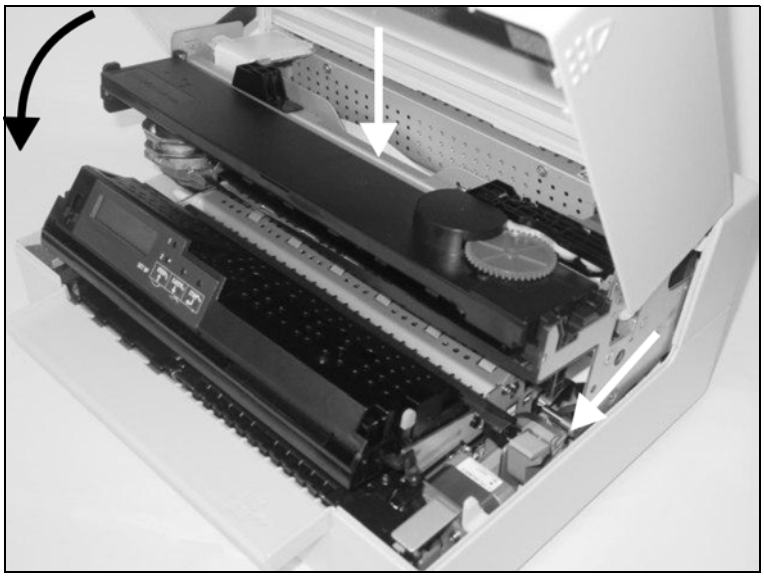
Pull the ribbon guide under the print head. Tighten the ribbon by turning the tension gear in the direction of the arrow (see image below).

Press the ribbon guide onto the print head from underneath until you hear it click into place.





Check if the ribbon is transported correctly by turning the tension gear in the direction of the arrow.



Close the main frame by pressing the colored section in the middle of the frame as shown and ensure both left and right hand sides of the frames are fully latched.

Close the cover. The printer is now ready to operate and to be switched on again.

We recommend to check the printer's operation after replacing the ribbon cassette by performing a printout of the parameter settings (see section *Printing out the status page*, page 53).

7 Replacing the print head

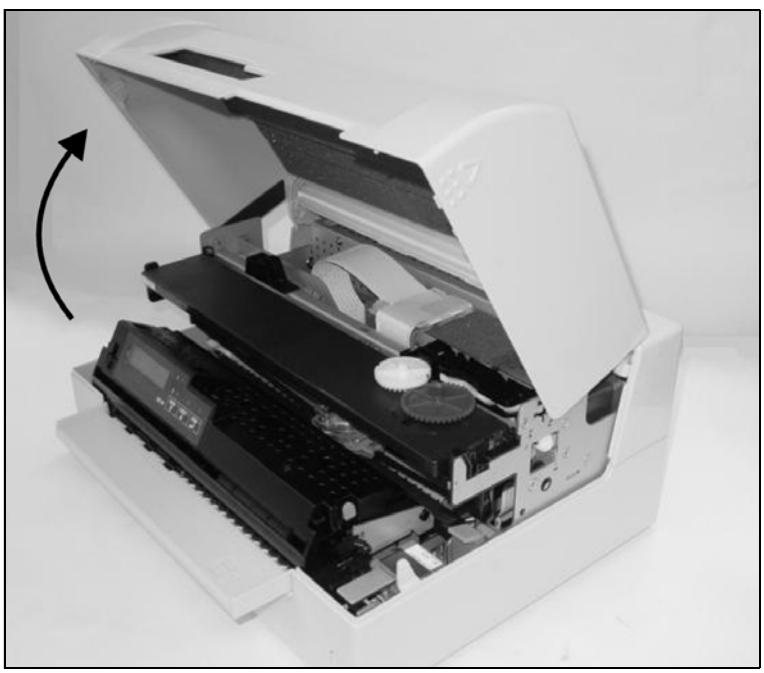
As the print head has a very long life, under normal circumstances it rarely needs replacing.

STOP **Always take care not to print over the edge or on a fold or perforation, as this can damage the needles of the print head. Damage of the needles will lead to a bad print image.**

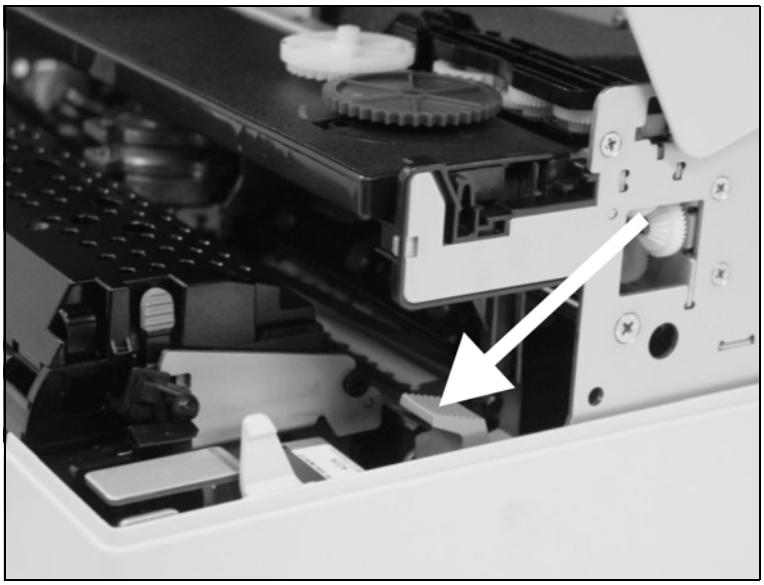
Should the print head be defective, you can replace it. Proceed as described below.

Be sure to switch the printer off before you replace the print head.

Removing the print head



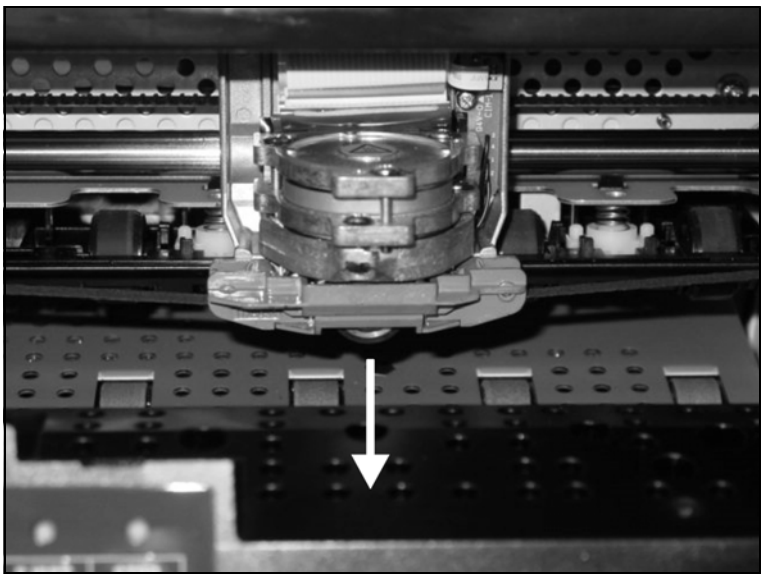
Open the top cover by grasping it at the right and left-hand side and swing it upward until it clicks into position.



Press the green release lever for the printing mechanism. This swings the printing mechanism backwards.

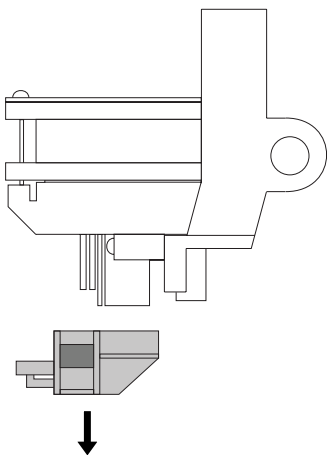
STOP

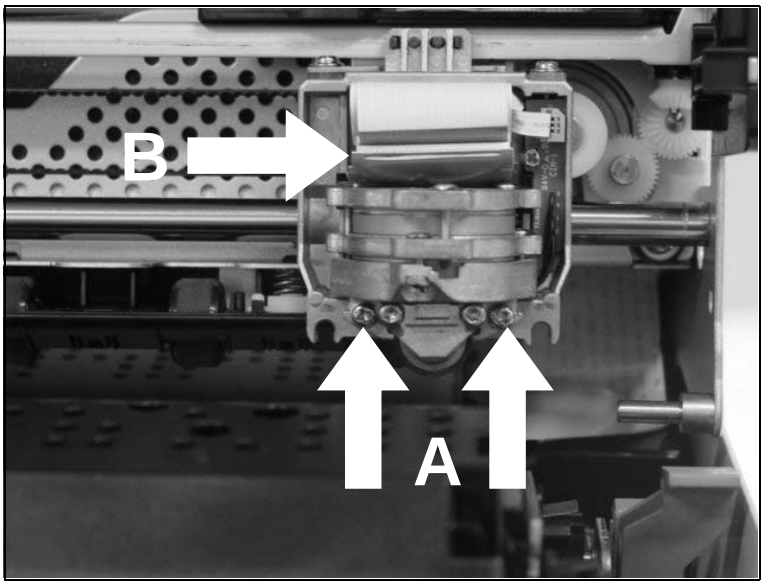
If the printer has been printing for a long time, the print head can be hot. Wait until it has cooled to a temperature suitable for handling.



Move the print head to center of the carriage to allow enough room to remove the ribbon guide from the print head.

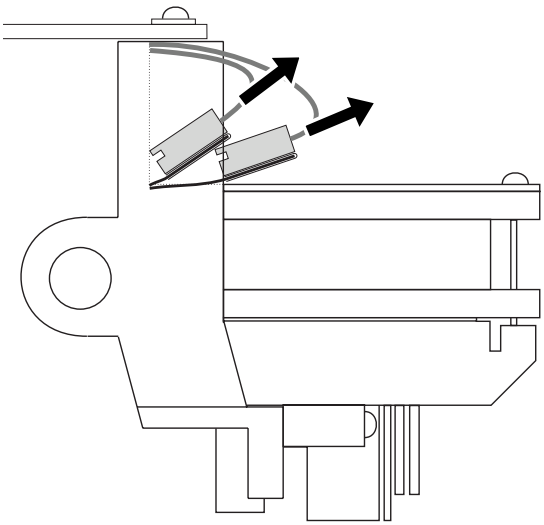
Remove the colored ribbon guide from the print head by pulling it downwards.

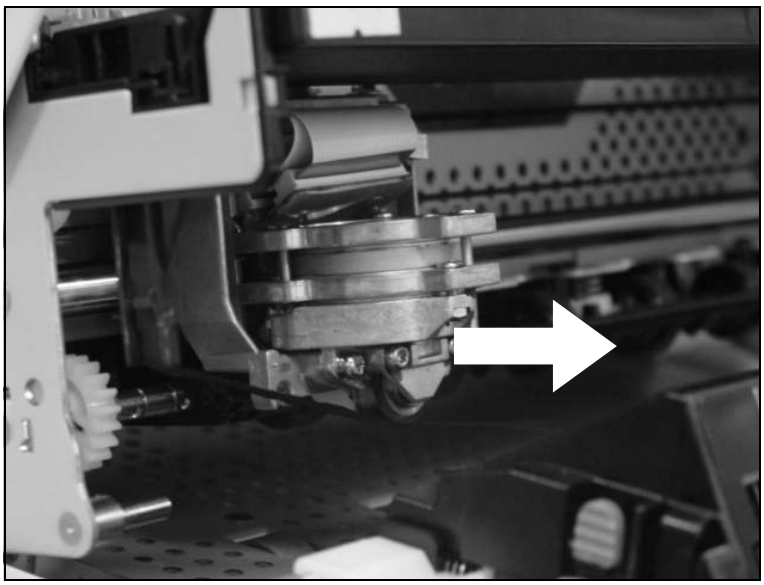




Remove the two outside located screws **A** from the print head.

Disconnect the two flexible cables **B** from the print head.

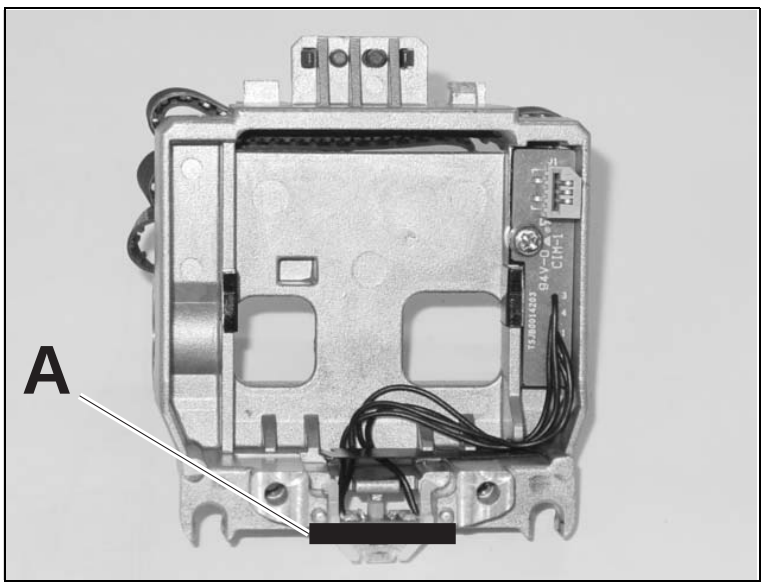




Now remove the print head from its mounting by easing it forward.

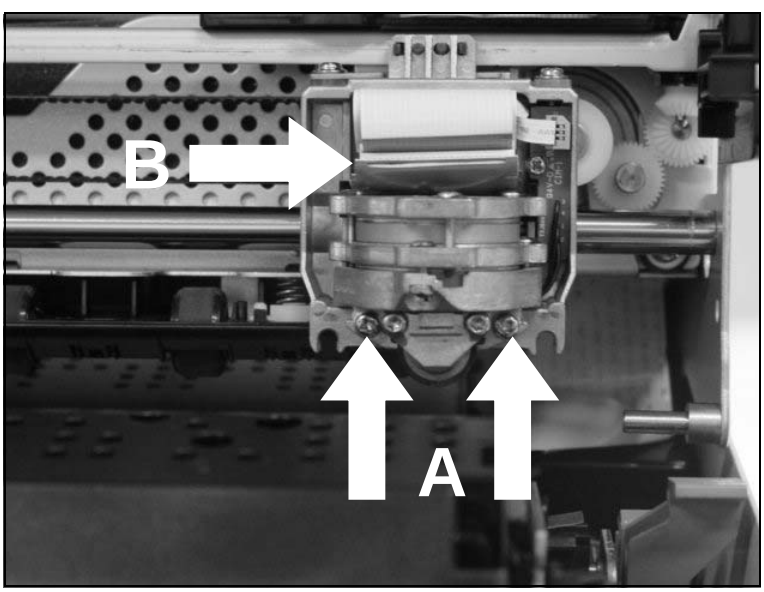
Ensure proper disposal of the print head in accordance with the applicable national laws and regulations.

Inserting new print head



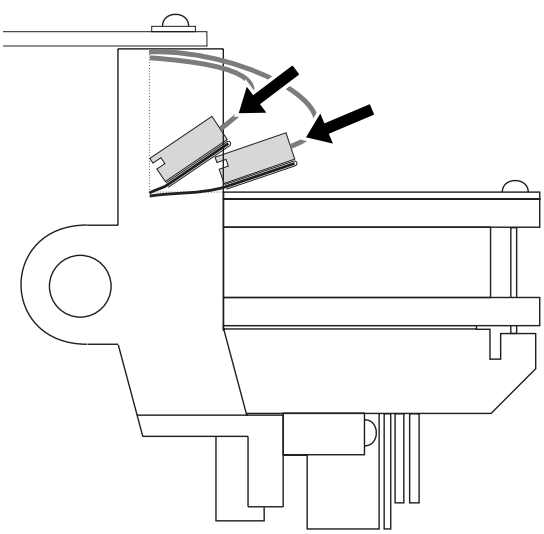
Ease the new print head down into the mounting.

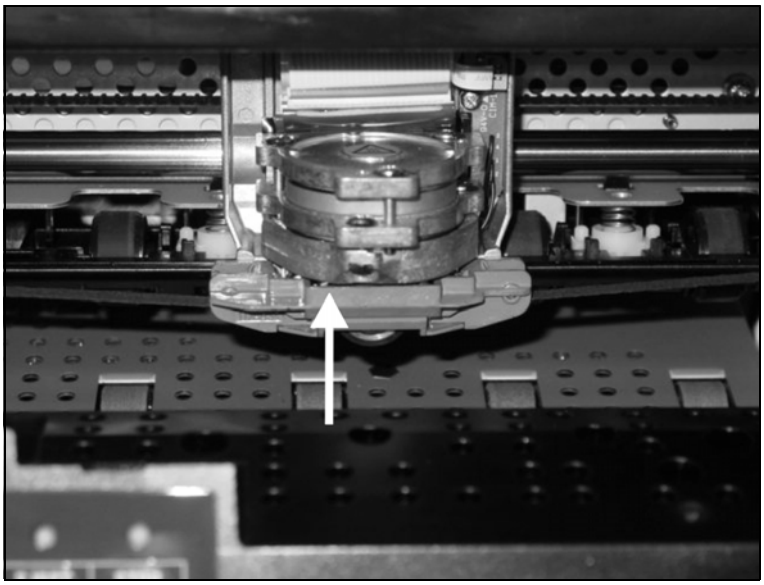
Set the print head onto the center of area **A**.



Fasten the two screws **A**.

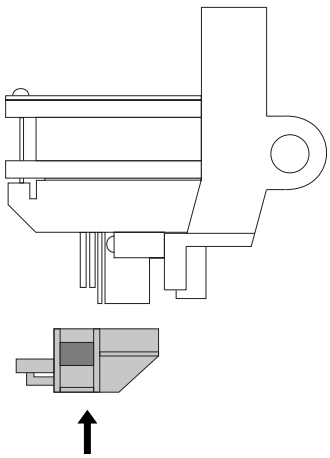
Connect the flexible cables **B** to each connector. Make sure to push them fully into the connectors; do not kink the cables.

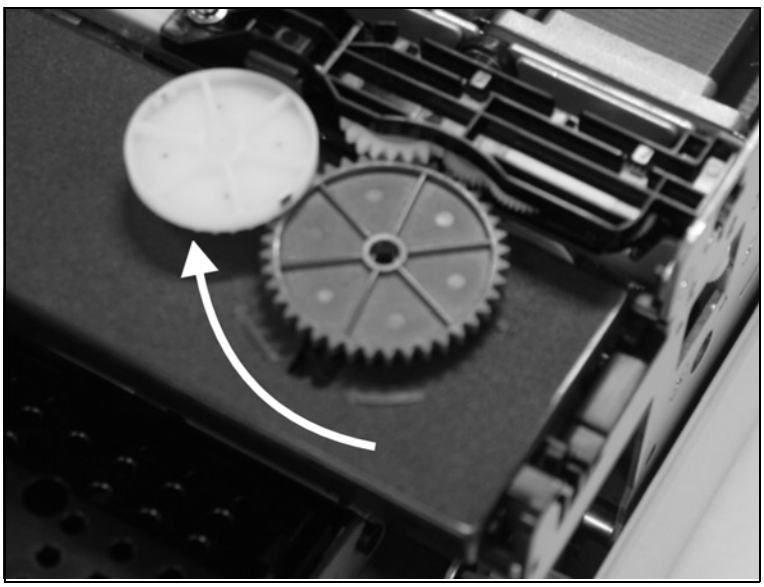




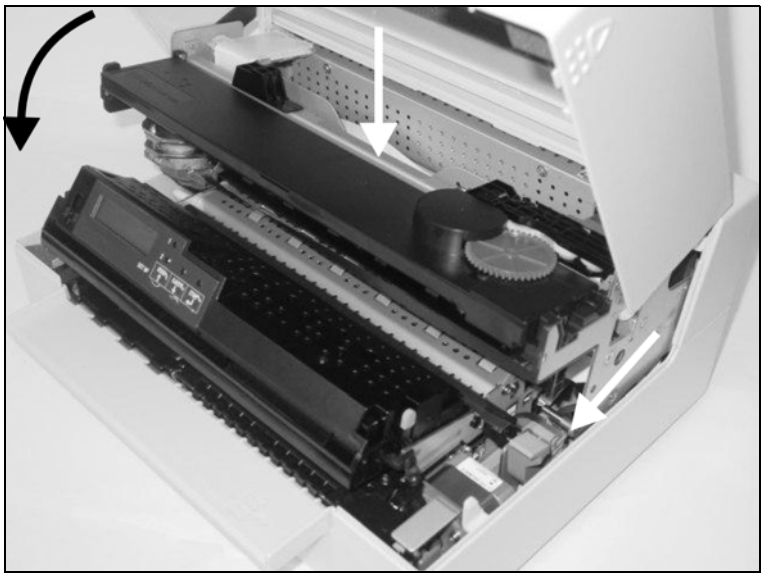
Pull the ribbon guide under the print head. Tighten the ribbon by turning the tension gear in the direction of the arrow (see image below).

Press the ribbon guide onto the print head from underneath until you hear it click into place.





Ensure that the ribbon material is moving correctly by turning the tension gear in the direction of the arrow.



Close the main frame by pressing the colored section in the middle of the frame as shown and ensure both left and right hand sides of the frames are fully latched.

Close the cover. The printer is now ready for operation and can be switched on again.

We recommend to check the printer's operation after replacing the print head by performing a printout of the parameter settings (see section *Printing out the status page*, page 53**).**

8 Menu

Programming using the control panel

As well as being able to control your printer via your applications software you use, you can also program the printer directly. There are two programming options you can use:

- Programming via the control panel.
- Programming via the interface using Escape sequences or control codes.

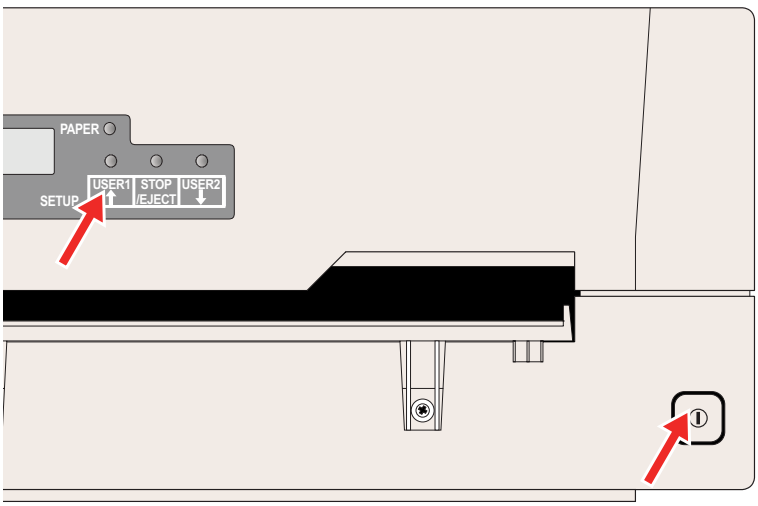
Settings made by escape sequences have priority over settings made in menu mode; therefore they will override these. Informations on Escape sequences can be found in Appendix C, *Emulations*, page 107.

Programming via the interface gives you far greater freedom for designing your printed pages, however, it is also a more sophisticated method and requires some experience with programming languages and printer control systems.

All programming via the interface is lost after you turn off the printer, whereas the programming using the control panel, is saved and stored even after you turn off the printer.

Calling up the menu

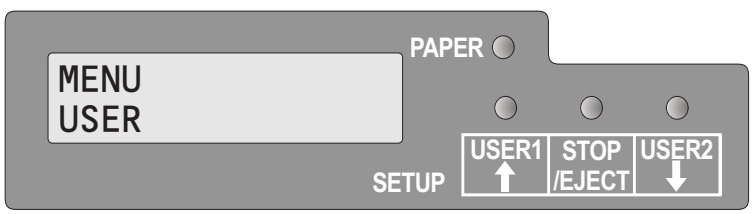
You can access the menu in the following way:



Ensure the printer is powered off.

Power on the printer whilst holding the **USER1 key**.

The printer initialises and the LCD displays the message:



Menu configurations (User 1/User 2)

Every printer is shipped with factory default settings. Basic settings such as emulation, character pitch, form length etc., which many applications make use of, are set. At the end of this chapter you will find a menu printout (status page) (*Status page (example)*, page 56) which shows the printer's default settings.

Your printer allows you to set and use two independent menu configurations (User 1 and User 2). If one of your applications for example requires an IBM printer while another program demands an EPSON printer, you can set an IBM emulation configuration with the desired settings, and set the second configuration as an EPSON emulation.

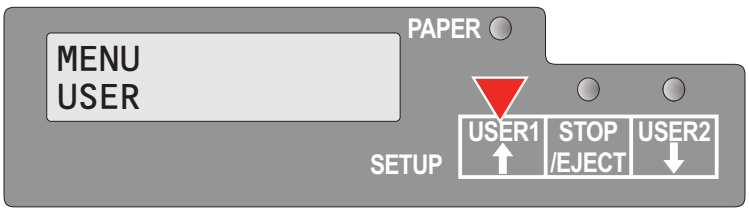
Menu handling

Key functions

You can navigate in the current menu using the three keys of the control panel.

USER 1 key

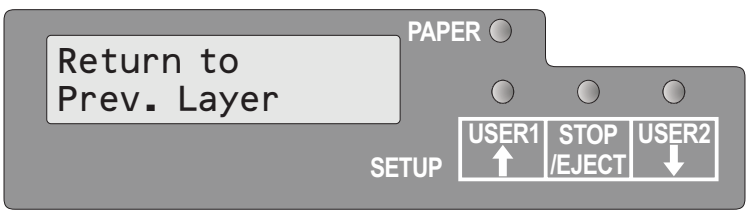
In menu mode the **USER 1 key** has the following functions:



Press the **USER 1 key** to return to the previous parameter group or parameter on the same menu level.

The **USER 1 key** is also used for changing parameter settings (see also *STOP/EJECT key*, page 48).

If this key is pressed when the first parameter group or parameter of the respective menu level is active, the following message appears on the LCD display:

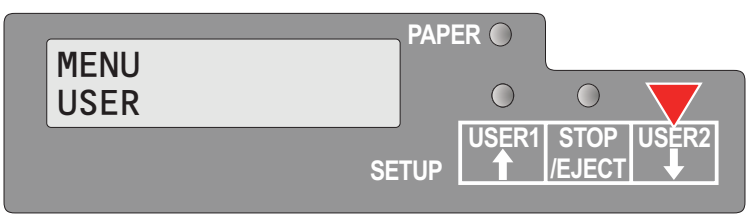


Pressing the **USER 1 key** again will open the last parameter group or parameter of the same menu level.

By pressing the **STOP/EJECT key** you will return to the previous menu layer (see also *STOP/EJECT key*, page 48).

USER 2 key

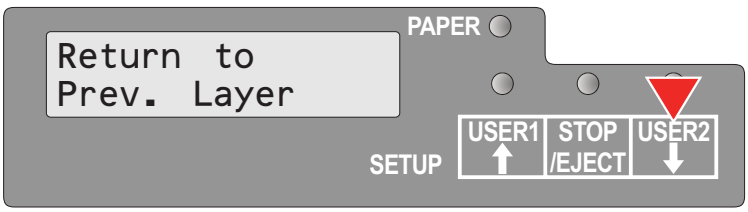
In menu mode the **USER 2 key** has the following functions:



Press the **USER 2 key** to select the next parameter group or parameter on the same menu level.

The **USER 2 key** is also used to change parameter settings (see also *STOP/EJECT key*, page 48).

If this key is pressed when the last parameter group or parameter of the respective menu level is active, the following message appears on the LCD display:

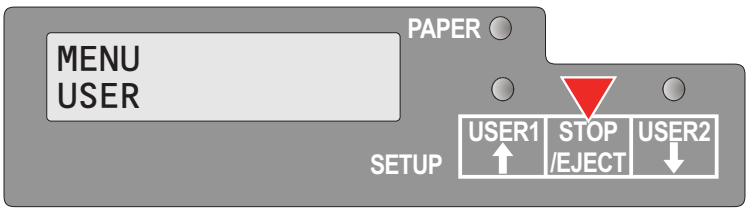


Pressing the **USER 2 key** again will open the first parameter group or parameter of the same menu level.

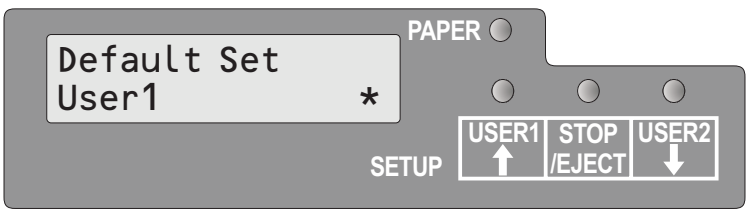
By pressing the **STOP/EJECT key** you will return to the previous menu layer (see also *STOP/EJECT key*, page 48).

STOP/EJECT key

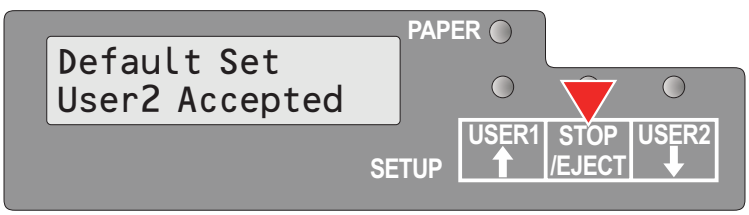
In menu mode the **STOP/EJECT key** has the following functions:



If pressed in a main menu level the next menu level is selected (e.g. **MENU USER** > **Default Set User 1**).



If pressed when a changeable parameter item is on the display, an asterisk appears on the display; you can now change this item now by pressing the **USER 1** or the **USER 2 key**.



If pressed after you have changed a parameter item the new value is confirmed. The LCD displays the message **Accepted** after the parameter item is changed.

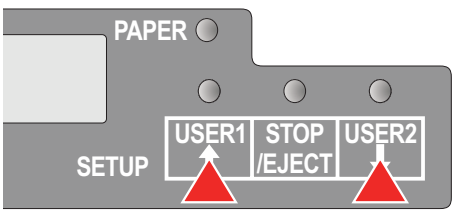
Setting parameters (principle)

Before you begin setting the parameters, you should check which parameters your system requires. Furthermore it is recommended to print out the status page which contains the actual valid parameter values (see *Printing out the status page*, page 53).

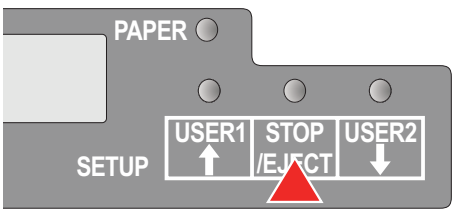
The initial values, which are activated after switching on or after error correction, are determined using the adjustable printer parameters. In many cases these parameters are overwritten by means of a system application.

Changed parameter settings are stored when the settings menu is exited and retain their values when the printer is switched off.

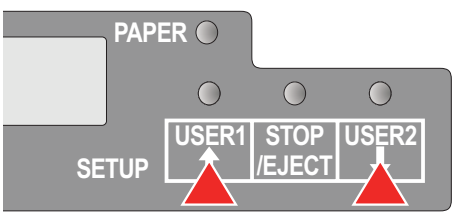
Make sure that the printer is in menu mode (see section *Calling up the menu*, page 46).



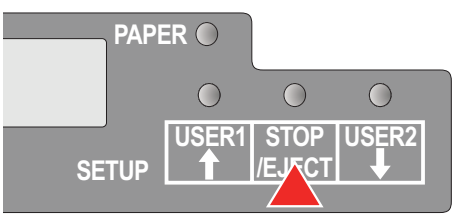
Press the **USER 2 key** to select next main menu or press the **USER 1 key** to select a previous main menu.



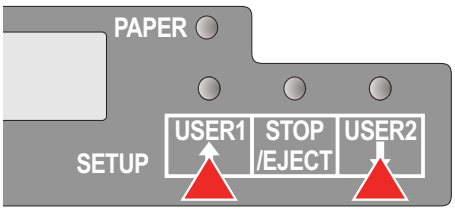
Press the **STOP/EJECT key** to enter to the Parameter select mode. The LCD displays the respective parameter and MENU.



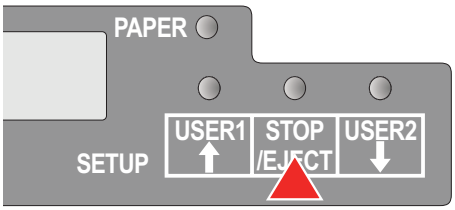
Press the **USER 2 key** to select a next parameter or press the **USER 1 key** to select a previous parameter.



Press the **STOP/EJECT key** to enter the MENU setting mode.

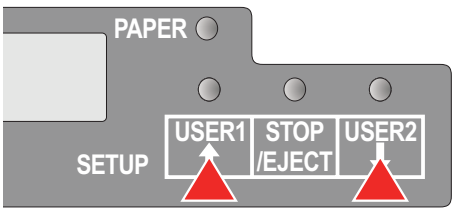


Press the **USER 2 key** to select a next parameter value or press the **USER 1 key** to select a previous parameter value.

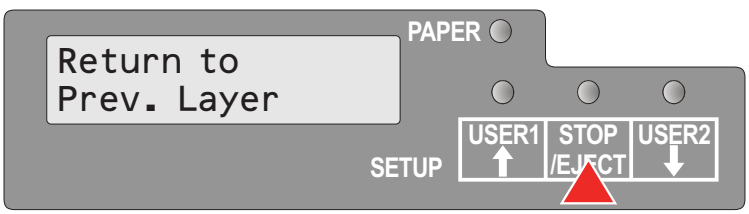


Press **STOP/EJECT key** to save a parameter value. In the second line of the LCD display the message **Accepted** appears. Press **STOP/EJECT key** again to confirm the setting.

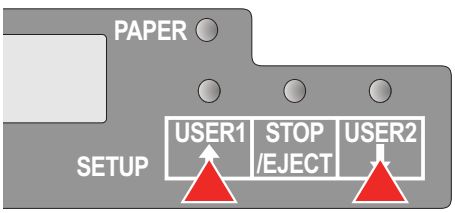
Terminating menu mode



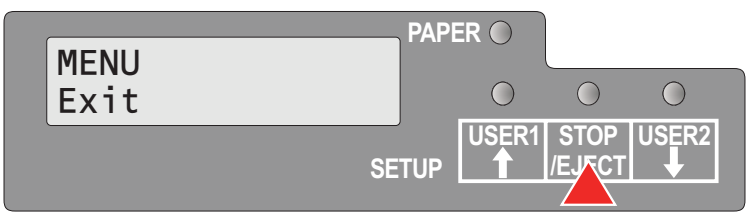
Repeatedly press the **USER 2 key** or the **USER 1 key** until the LCD displays the message:



Press the **STOP/EJECT key**.



Repeatedly press the **USER 2 key** or the **USER 1 key** until the LCD displays the message:



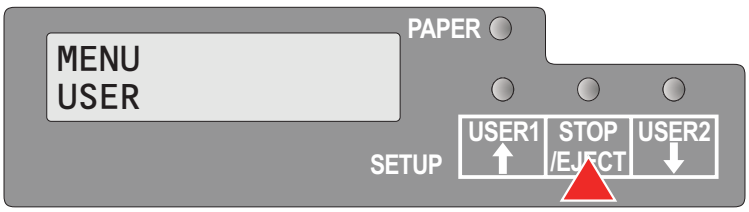
Press the **STOP/EJECT key**. Menu mode is terminated and the printer initializes.

Selecting the LC display language

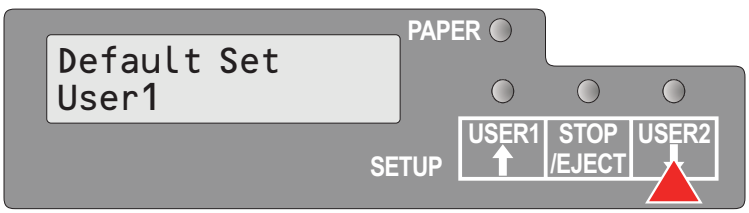
This section describes how to make settings in the menu, using the selection of the national language as an example.

This example shows how to change from the English language to the German language. The same procedure applies to the other languages (French, Italian, Spanish and Turkish).

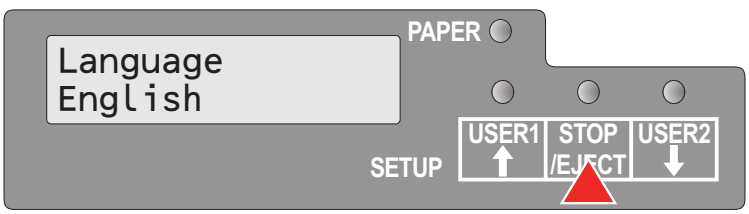
Make sure that the printer is in menu mode (see section *Calling up the menu*, page 46).



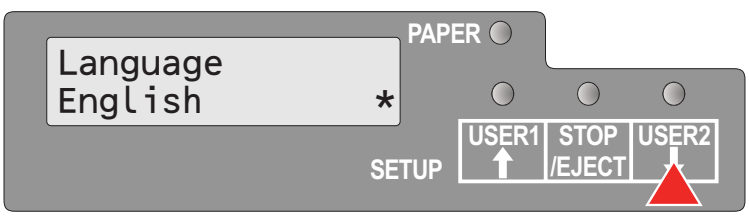
Press the **STOP/EJECT key**.



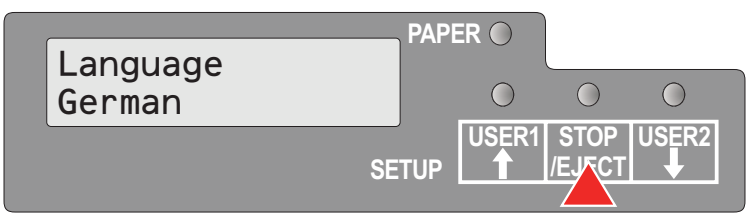
Press the **USER 2 key** several times, until in the LCD display appears:



Press the **STOP/EJECT key**. An asterisk appears in the display.



Press the **USER 2 key**.

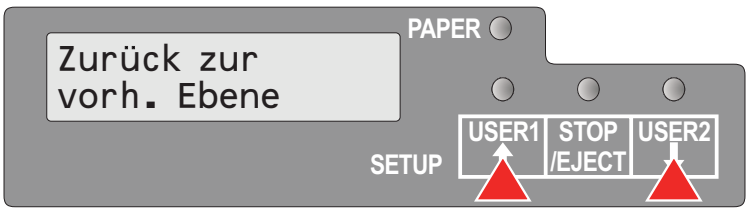


Press the **STOP/EJECT key**.

In the LCD display appears:

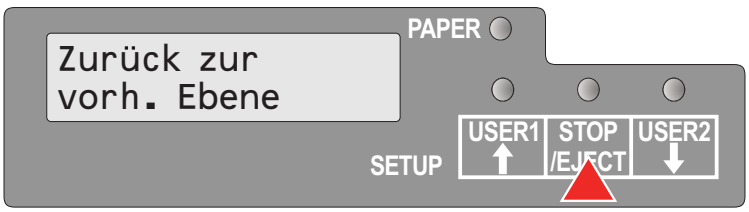
Press the **STOP/EJECT key** to confirm the selection.

The printer switch to german language immediately.



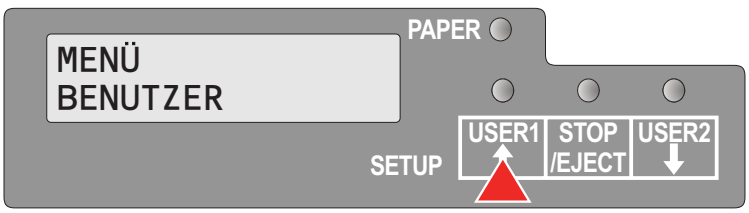
To change other parameter items in this menu level, use the USER 1 or **USER 2 key**s to navigate to the respective items.

To navigate to the previous menu level, press the **USER 1 key** repeatedly until the message **Zurück zur vorh. Ebene** (**Return to Prev. Layer**) appears in the LCD display.

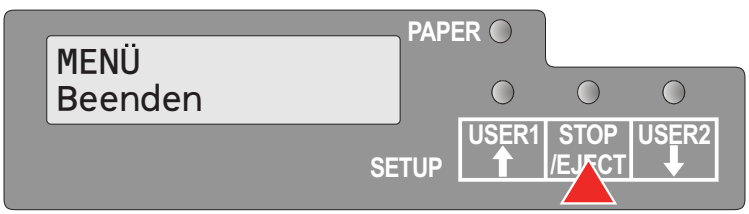


Press the **STOP/EJECT key**.

The LCD displays:



Press the **USER 1 key**.



Press the **STOP/EJECT key**. Menu mode is terminated and the printer initializes.

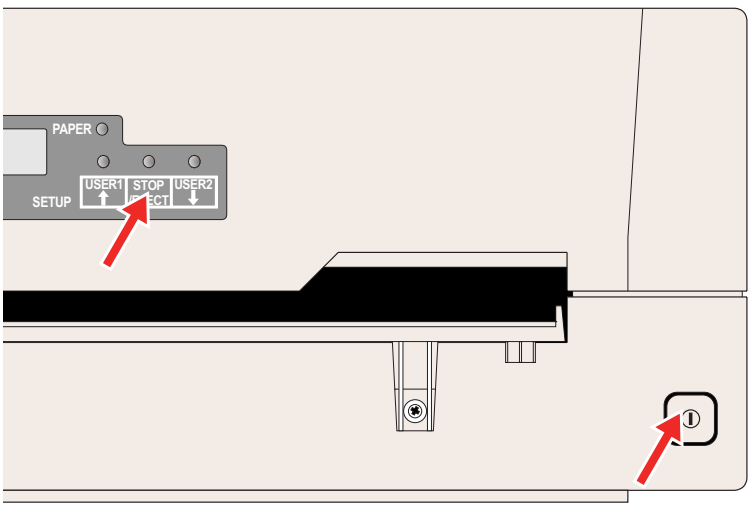
Printing out the status page

The printer has a function that allows you to printout the current parameter settings.

There are two ways to print out the parameter settings.

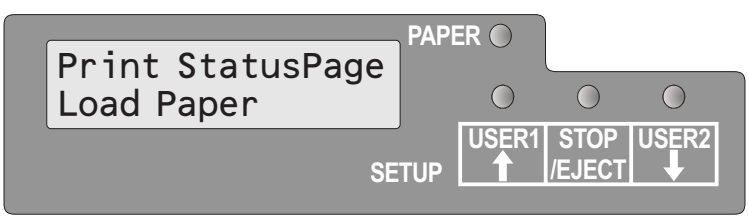
- Power on + **USER 2 key**
- Selection of "Test Print Status Page" in menu mode

Power on + USER 2 key

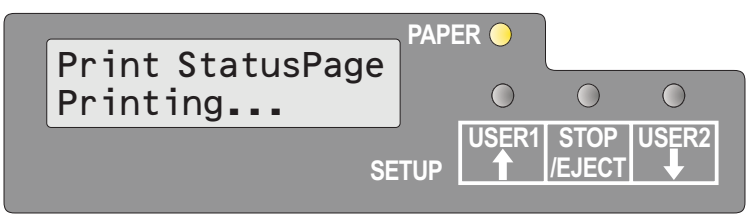


Power the printer off.

Press and hold the **USER 2 key** while switching on the printer.

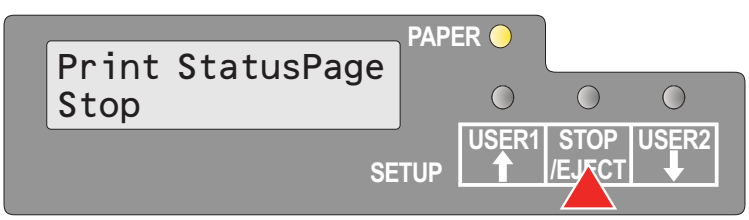


The LCD displays **Print StatusPage Load Paper**. Release the **USER 2 key**.

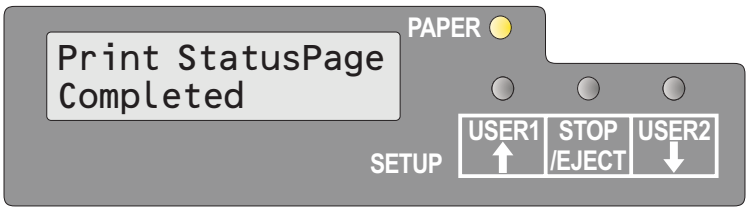


Insert the paper in the printer. The LCD displays **Print StatusPage Printing...** and the the status page is printed.

The paper will eject once printing is complete.



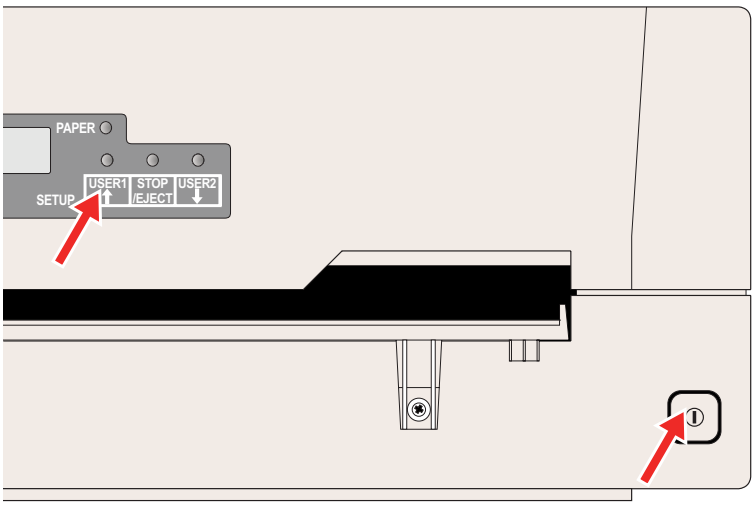
While printing, you can use the **STOP/ EJECT key** to cancel the printing. The LCD will display **Print StatusPage Stop**. Paper will be ejected and a reset will be performed.



When the test printout is aborted or completed, LCD will display **Print StatusPage Completed**.

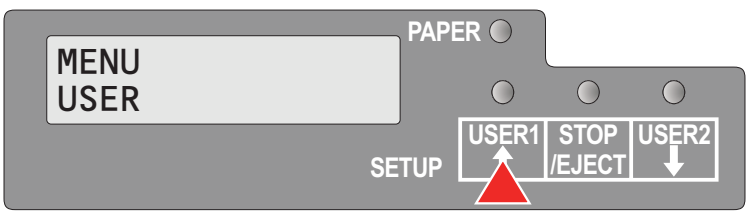
The Print setting mode will end automatically and a Power ON reset will be performed.

Print out status page in menu mode

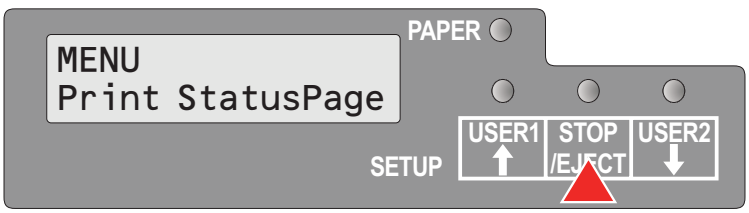


Power the printer off.

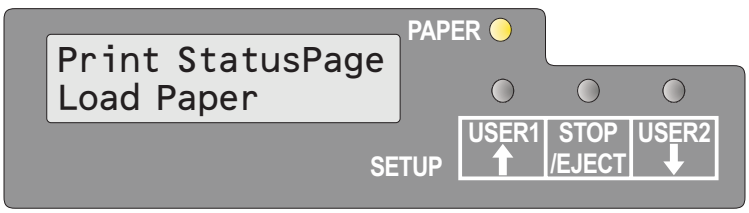
Press and hold the **USER 1 key** while switching on the printer.



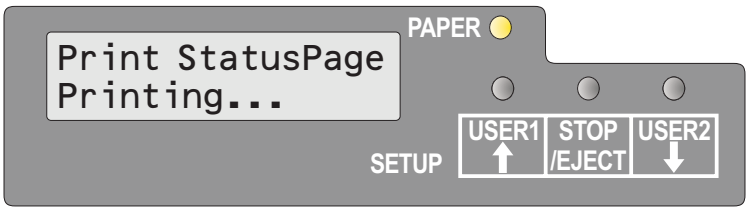
Press the **USER 1 key** twice. The following message appears in the LCD display:



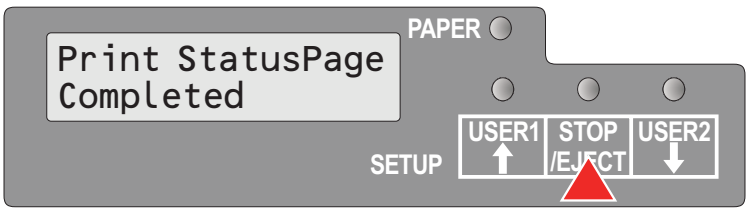
Press the **STOP/EJECT key**.



Insert the paper in the printer. The LCD displays **Print StatusPage Printing...** and the status page is printed.



The paper will be ejected once printing is complete.

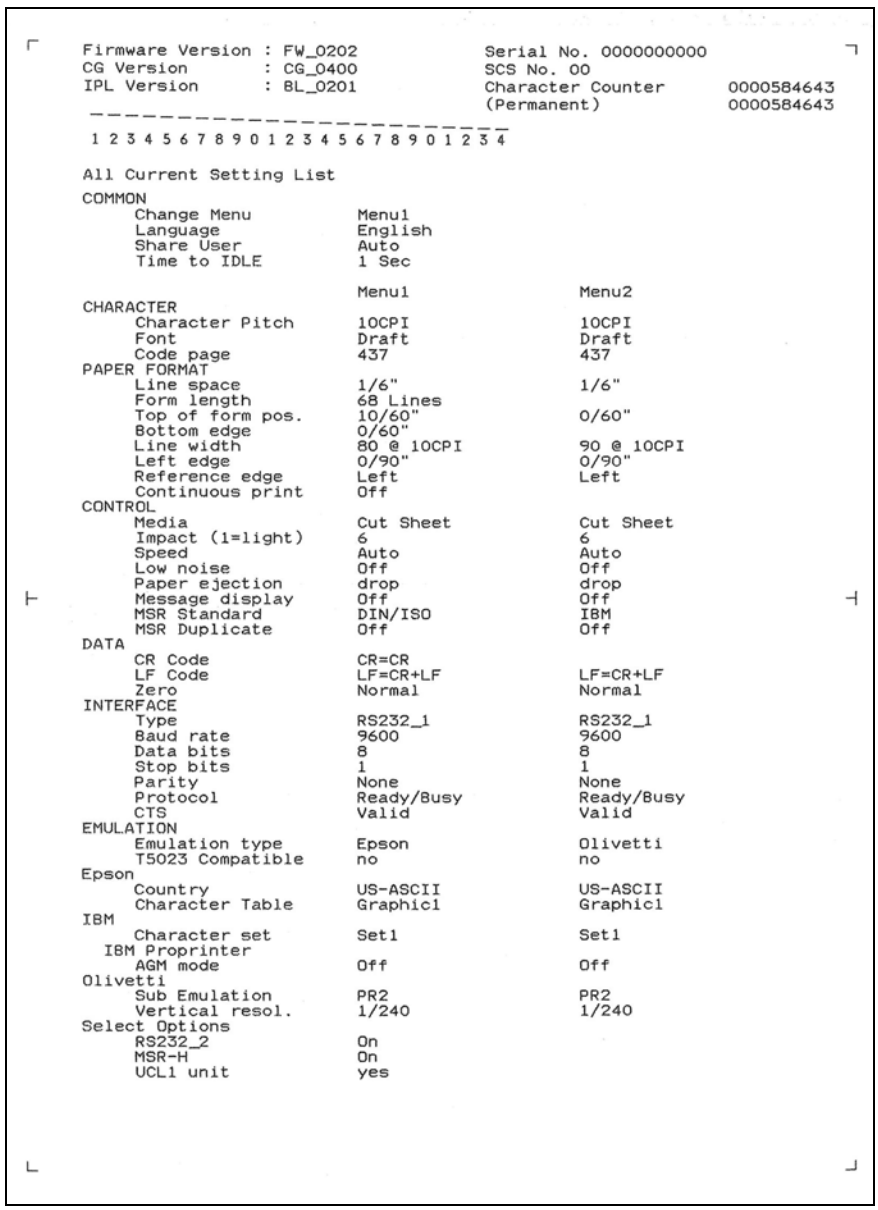


When the test printout is aborted or completed, LCD will display **Print StatusPage Completed**.

Press the **STOP/EJECT key** to return to menu mode.

If you want to terminate Setup Mode after the printout of the status page, hold the **STOP/EJECT key** pressed for three seconds after **Print StatusPage Completed** is displayed. Setup mode will be ended and a reset will be performed.

Status page (example)



```
Firmware Version : FW_0202          Serial No. 0000000000
CG Version       : CG_0400          SCS No. 00
IPL Version      : BL_0201          Character Counter      0000584643
                                    (Permanent)            0000584643
 ----------------------------
 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4

All Current Setting List
COMMON
     Change Menu           Menu1
     Language              English
     Share User            Auto
     Time to IDLE          1 Sec

                           Menu1                  Menu2
CHARACTER
     Character Pitch       10CPI                  10CPI
     Font                  Draft                  Draft
     Code page             437                    437
PAPER FORMAT
     Line space            1/6"                   1/6"
     Form length           68 Lines
     Top of form pos.      10/60"                 0/60"
     Bottom edge           0/60"
     Line width            80 @ 10CPI             90 @ 10CPI
     Left edge             0/90"                  0/90"
     Reference edge        Left                   Left
     Continuous print      Off
CONTROL
     Media                 Cut Sheet              Cut Sheet
     Impact (1=light)      6                      6
     Speed                 Auto                   Auto
     Low noise             Off                    Off
     Paper ejection        drop                   drop
     Message display       Off                    Off
     MSR Standard          DIN/ISO                IBM
     MSR Duplicate         Off                    Off
DATA
     CR Code               CR=CR
     LF Code               LF=CR+LF               LF=CR+LF
     Zero                  Normal                 Normal
INTERFACE
     Type                  RS232_1                RS232_1
     Baud rate             9600                   9600
     Data bits             8                      8
     Stop bits             1                      1
     Parity                None                   None
     Protocol              Ready/Busy             Ready/Busy
     CTS                   Valid                  Valid
EMULATION
     Emulation type        Epson                  Olivetti
     T5023 Compatible      no                     no
Epson
     Country               US-ASCII               US-ASCII
     Character Table       Graphic1               Graphic1
IBM
     Character set         Set1                   Set1
  IBM Proprinter
     AGM mode              Off                    Off
Olivetti
     Sub Emulation         PR2                    PR2
     Vertical resol.       1/240                  1/240
Select Options
     RS232_2               On
     MSR-H                 On
     UCL1 unit             yes
```

Menu parameters

The following section introduces and explains all the possible menu settings. The default setting is marked by an asterisk (*)

Parameter group	Parameter	Possible settings	Description
MENU COMMON	Default Set	Off * All Menu 1 Menu 2	Sets all parameters to the default settings. Menu 1 sets all parameters of Menu 1 to the default settings. Menu 2 sets all parameters of Menu 2 to the default settings.
	Copy Menu	Menu1 to Menu2 * Menu2 to Menu1	Copies the settings of Menu 1 to Menu 2 and vice versa.
	Change Menu	Menu1 * Menu2	Defines if the parameter settings of Menu 1 or of Menu 2 are changed.
	Language	English * German French Spanish Italian Turkish	Selects the display language.
	Share User	Auto * Manual[1)]	Selects the method to share this printer with multiple users. Auto: Printer handles print jobs for User 1 and User 2 automatically. Manual: After receiving a print job for User 1 or User 2 the respective **USER 1** or **USER 2 key** must be pressed to start the printout.
	Time to Idle	1 sec * 10 sec 30 sec 60 sec	Selects the time in seconds to return to idle state after completion of all jobs and ejecting paper in order to change to another user in case of Auto mode. **NOTE:** This parameter is only displayed if under Share User the setting Auto has been selected.
MENU CHARACTER	Character Pitch	10 CPI * 12 CPI 15 CPI 17 CPI 20 CPI 24 CPI Proportional	Sets the characters per inch (character pitch). The higher the parameter the smaller the character spacing. If Proportional is selected, only the actually required space for the character width is used.

1) Only in Epson and IBM emulation
2) Only if MSR-H is installed
3) Only for printer model with second serial interface

Parameter group	Parameter	Possible settings	Description
	Font	Draft * Draft Banking Courier Roman Sans Serif Gothic OCR-A OCR-B	This parameter selects the character style. The fonts available depend on the installed character generator. For more information on character generators, refer to *Loading firmware*, page 15
	Code Page	437*, 850, 860, 863, 865, 851, 852, 853, 855, 857, 866, 869, USSR Gost, 864, 437G, 920 (8859-9), 858, 923 (8859-15), ISO 8859-2 East Europe, ISO 8859-5 Cyrillic, ISO 8859-7 Greece, ISO 8859-8 Hebrew, 1250 Windows Latin2, 1251 Windows Cyrillic, 1252 Windows Latin1, 1253 Windows Greek, 1254 Windows Latin5, 1255 Windows Hebrew, 1256 Windows Arabic, 1257 Windows Baltic Rim	Selects the character set. Character sets can be used according to the selected emulation. The character sets are not necessarily available for all fonts; see also *Available code pages and fonts, page 104*.
MENU PAPER FORMAT	Line space	1/5 1/6 * 1/8	Sets the line density in lines per inch. 1/6 = 6 lines per inch
	Form length[1)]	6 Lines | 68 Lines * | 90 Lines A4	Sets the form length either via line formats or the standard format A4. Please note that the adjustment in lines depends on the selected line space (see above). For example 6 LPI at a selected line number of 90 lines results in a formlength of 15 inches (90 lines/[6lines/inch] = 15 inches).

1) Only in Epson and IBM emulation
2) Only if MSR-H is installed
3) Only for printer model with second serial interface

Parameter group	Parameter	Possible settings	Description
	Top of form pos.	0/60 | 10/60 * | 60/60	Sets the position of the first printing line. The factory setting for the first printing position is 10/60" (4,23 mm). This is equivalent to the second line from the top.
	Bottom edge[1)]	0/60 30/60 *	Sets the distance between last printing line and bottom edge.
	Line width	80 @ 10 cpi[1)] * 90 @ 10 cpi 94 @ 10 cpi	Sets the line length; unit is number of characters at a character density of 10 cpi. If 80 is chosen in Olivetti emulation, 90 is used for the line length instead of 80.
	Left edge	0/90“ * | 90/90“	Sets the left margin; unit is n/90 inch.
	Reference edge	Left * Right	Sets the horizontal leading edge. Left: the left edge of the character matrix is aligned to the the left edge of the document. Right: the right edge of the character matrix is aligned to the right edge of the document.
	Continuous Print	Off * On	Selects the handling of paper when the vertical position exceeds the form length.
MENU CONTROL	Media	Cut Sheet * H. Binding V. Binding	Specifies the media type. Select H. Binding if you want to print passbooks with horizontal binding, V. Binding for passbooks with vertical binding. Cut Sheet: 400 cps max H. Binding: 300 cps max V. Binding: 300 cps max
	Impact	1, 2, 3, 4, 5, 6*, 7, 8	Selects the impact strength of the print head for printing on cut sheets. This ensures that single or copy paper produces optimum results. 6: for single-ply paper. 7: for 2- or 3-ply paper 8: for 4-ply paper and above
	Speed	Auto * Normal High	Auto: depends on the settings of MEDIA Normal: 300 cps High: 400 cps
	Low noise	Off * On	Switches the low noise function on and off.

1) Only in Epson and IBM emulation
2) Only if MSR-H is installed
3) Only for printer model with second serial interface

Parameter group	Parameter	Possible settings	Description
	Paper ejection	drop * hold	Selects the paper position after paper ejection.
	Message display	Off * On	Selects displaying messages on or off in Olivetti, EPSON and IBM 4722 emulation. **NOTE:** These messages will not be displayed if IBM Proprinter XL is selected as Emulation Type.
	MSR-H Standard[2)]	IBM * (Olivetti) DIN/ISO * (Epson) ANSI	Selects the MSR-H (magnetic stripe reader) standards.
	MSR-H Duplicate[2)]	Off * On	Selects if the MSR block will be duplicated or not.
MENU DATA	CR Code	CR=CR * CR=CR+LF	Defines the action prompted by a carriage return. CR=CR: carriage return only CR=CR+LF: carriage return and a line feed.
	LF Code	LF=LF * LF=CR+LF	Defines the action prompted by a line feed. LF=LF: line feed only LF=CR+LF: carriage return and line feed.
	Zero	Normal * Slashed	Selects if normal zero (0) or the slashed zero (Ø) is printed.
MENU INTERFACES	Type	RS232_1 Parallel USB RS232_2[3)]	Selects the interface. Printer can be configured either for serial, parallel or USB connection. Two interfaces can be used at the same time, one assigned to User 1 and one to User 2.
	If RS232_1 is selected		
	Baud rate	4800 9600 * 19200 38400	Selects the data transmission rate (baud rate) (baud = bit per second).
	Data bits	7 8 *	Selects the number of data bits per data byte.
	Stop bits	1 * 2	Selects if one or two stop bits are used per data byte.
	Parity	Even Odd None *	The parity test for received data bytes can be selected. None causes transmission in both directions without parity bit. If Even or Odd is selected, the bytes are checked to ensure they have even or odd parity.

1) Only in Epson and IBM emulation
2) Only if MSR-H is installed
3) Only for printer model with second serial interface

Parameter group	Parameter	Possible settings	Description
	Protocol	Ready/Busy * Xon/Xoff	Selects the type of protocol, i.e. a certain set of rules and procedures for ensuring error-free data exchanges between computer and printer. Details of the available protocols can be found in the section *Serial attachment characteristics*, page 131.
	CTS	Valid * Invalid	Sets the signal CTS (**C**lear **T**o **S**end) on or off.
	If Parallel is selected		
	Parallel Bidir	On * Off	Sets the bidirectional data transfer (IEEE1284): if set to on ECP is supported, if off Nibble mode only is supported.
	If RS232_2 is selected[3)]		
	Baud rate 2	4800 9600 19200 * 38400	Selects the data transmission rate (baud rate) (baud = bit per second).
	Data bits 2	7 8 *	Selects the number of data bits per data byte.
	Stop bits 2	1 * 2	Selects if one or two stop bits are used per data byte.
	Parity 2	Even Odd None *	The parity test for received data bytes can be selected. None causes transmission in both directions without parity bit. If Even or Odd is selected, the bytes are checked to ensure they have even or odd parity.
	Protocol 2	Ready/Busy * Xon/Xoff	Selects the type of protocol, i.e. a certain set of rules and procedures for ensuring error-free data exchanges between computer and printer. Details of the available protocols can be found in the section *Supported protocols*, page 131.
	CTS 2	Valid * Invalid	Sets the signal CTS (**C**lear **T**o **S**end) on or off.
MENU EMULATION	Emulation type	Epson * (User 1) IBM Proprinter XL Olivetti * (User 2) IBM 4722	Selects the emulation for the printer. For further details refer to chapter *Emulations*, page 107
	T5023 Compatible	No * Yes	Selects if the printer is compatible to the T5023 printer or not.

1) Only in Epson and IBM emulation
2) Only if MSR-H is installed
3) Only for printer model with second serial interface

Parameter group	Parameter	Possible settings	Description
MENU Epson	Emulation type	US-ASCII * France Germany Great Britain Denmark 1 Sweden Italy Spain 1 Japan Norway Denmark 2 Spain 2 Latin America	Selects the national character set in Epson emulation. The character sets are not necessarily available for all fonts; see also section *Available code pages and fonts, page 104*.
	Character Table	Italic Graphic1 * Graphic2	Only available for Epson emulation. Either the Epson character set Italics or the IBM graphics character set 1 or 2 can be activated in the code range from hex. A0 to hex. FE.
MENU IBM	Character set	Set1 * Set2	Selects the character set with standard characters or extended characters in IBM emulation.
	AGM mode	Off * On	Activates or deactivates the AGM (**A**lternative **G**raphics **M**ode) mode in IBM emulation.
MENU Olivetti	Sub Emulation	PR2 * PR50 PR2845	Selects the Olivetti sub emulation.
	Vertical resol.	1/240 * 1/216	Selects the vertical resolution (line spacing)
MENU Print StatusPage	—	—	Prints out a list of alle current parameter settings.
MENU Exit	—	—	Terminates the menu mode.

1) Only in Epson and IBM emulation
2) Only if MSR-H is installed
3) Only for printer model with second serial interface

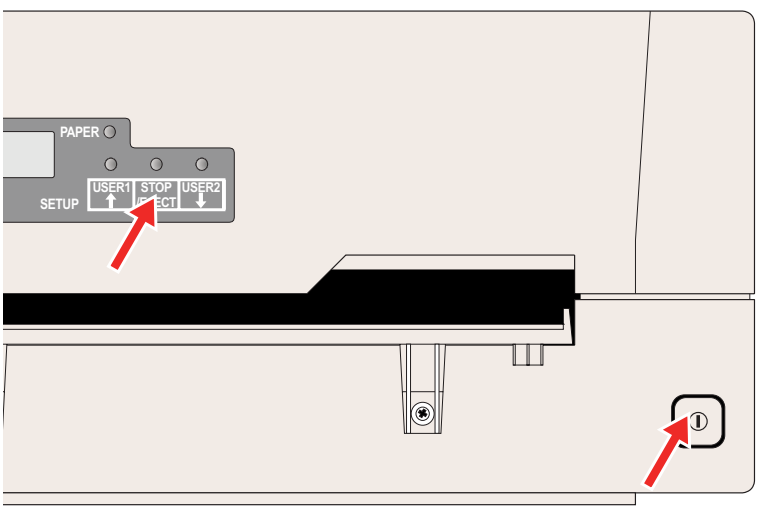
Test function

Hex Dump

With the interface mode (Hex-Dump/H-Dump) you can diagnose data transmission from the computer to the printer. In this special mode, the data from the computer is printed out in two columns. The text in the left column is printed in hexadecimal format and in the right column in ASCII format. This can be used to diagnose print problems.

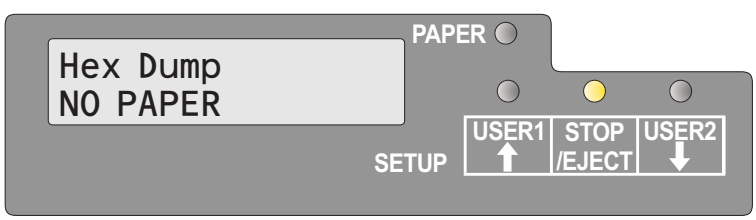
Some applications require status response from the printer. In such case Hex Dump is ineffective for diagnosing problems. In these cases contact your customer support or dealer for assistance.

Activating Hex Dump



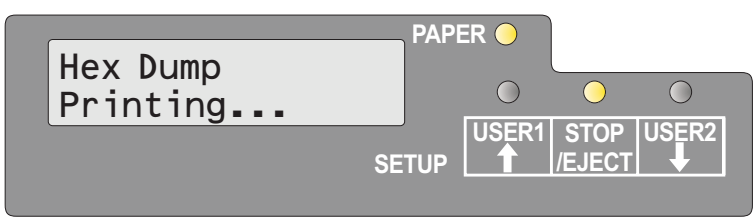
Switch off the printer.

Keep the **STOP/EJECT key** pressed and power the printer on by pressing the ON/OFF key. Keep the **STOP/EJECT key** pressed until **Hex Dump NO PAPER** appears on the LCD display.



Insert a sheet of paper. The sheet is drawn in.

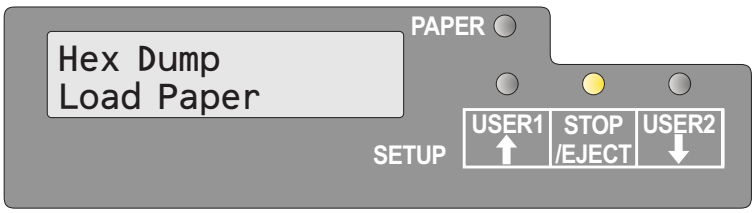
Send the test file from your PC to the printer.



The message **Hex Dump Printing...** is displayed and data is printed. USER 1 and USER „ keys are invalid during printing.

After printing is complete, press the **STOP/EJECT key** to print all remaining data in the line buffer.

You can use the **STOP/EJECT key** to interrupt the test printout.

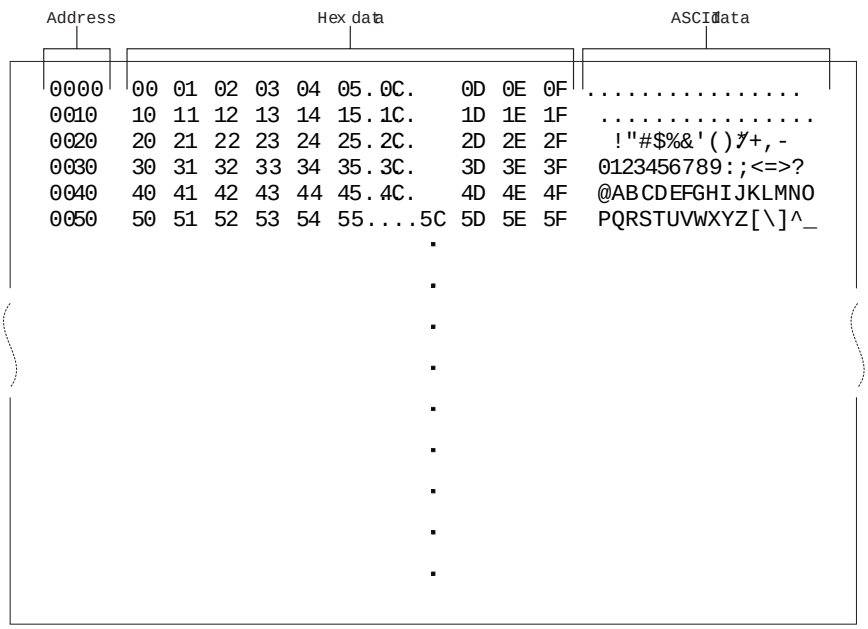


If the printer receives data when there is no paper in the printer, the message will be changed to **Hex Dump Load Paper**.

Exiting the test mode

You can only exit the test mode by switching off the printer.

Test printout Hex Dump (Example)



9 Troubleshooting

Many of the faults and problems which may occur while using the printer are minor problems which you can solve yourself. The following chapter should help you to distinguish between a simple operating error and a major malfunction.

This chapter provides information on the rectification of faults without the assistance of specially trained personnel. Follow the advice and tips in this chapter if your printer is not working correctly.

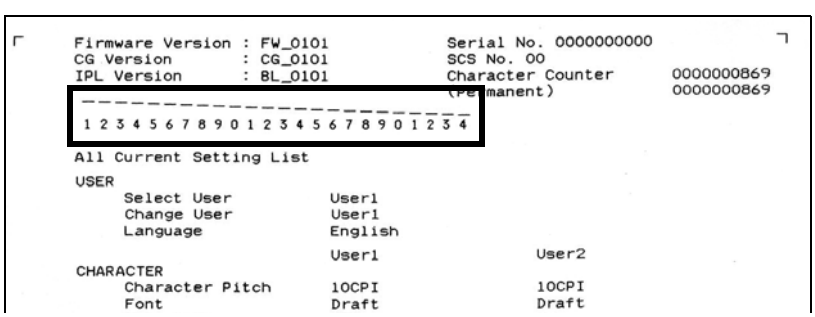
Repairs should only be performed by authorised service personnel.

General print problems

Problem	Corrective action
The display remains dark The printer is switched on, but nothing happens (nothing is displayed, no noise).	Switch off the printer and proceed as follows: **1.** Check that the power plug is correctly connected to the socket on the printer. **2.** Check that the power plug is seated properly in the wall socket. **3.** Switch on the printer again. If the printer is now connected correctly, the printer initializes and text is shown on the display. If these steps do not eliminate the fault: ▸ Replace the power cord and repeat step 3. ▸ Check that power flows at the socket e.g. using a desk lamp, if necessary use a different socket and repeat step 3. ▸ Contact your dealer if the printer cannot be powered up. STOP **Do not attempt to dismantle the printer. You might suffer an electric shock.**
The display is lit, but the printer does not print	**1.** Check that the printer is Online. If the displays shows **Stop**, then press the STOP/EJECT key. Try to print again. **2.** Check the connection from the printer to the computer (interface cable): ▸ Check that the interface cable is properly connected to the computer and to the printer. ▸ Check that it is the correct interface cable for your printer. Information on the interface is located in the section *Connecting the printer*, page 8, and in chapter *Interfaces*, page 127. ▸ Check that the printer is properly adapted to the computer (configured). Refer to section *Control panel*, page 17. Check the parameter set in the menu under *INTERFACES*, page 60, and if necessary correct it. **3.** Check whether the printer is working properly. To do this, print out a copy of the menu; see *Printing out the status page*, page 53. **4.** Check that the top cover is closed. **5.** Check that paper is inserted and loaded. Refer to the chapter *Print media*, page 29.

Problem	Corrective action
Problems with paper feed Paper will not load or feed	**1.** Check that the correct media type is selected in the menu, if necessary select the correct media type. See section *Media*, page 59. **2.** Check if the right edge of the document is positioned inside the area between the left side of the symbol and the right edge of the document support. See section *Inserting a document*, page 29. **3.** Make sure that the paper meets the paper specifications. See section *Paper specifications*, page 85.

Problems with the print quality

Problem	Corrective action
Print is faulty	The inserted document is too thick. Use a document with the correct thickness. Refer to the section *Paper specifications*, page 85 and the chapter *Print media*, page 29.
Print is too pale	The ribbon exhausted or the ribbon cassette is not correctly fitted. Refer to the chapter *Changing the ribbon cassette*, page 33.
Smudged print	The ribbon is damaged (e.g. frayed). Change the ribbon as described in the chapter *Changing the ribbon cassette*, page 33.
Dots within characters are missing	**1.** Check whether the ribbon is damaged. To do so check the ribbon cassettes functionality by turning the green tension gear in direction of the arrow on the cassette; check if the ribbon itself is torn or has holes etc. If necessary replace the ribbon cassette; see the chapter *Changing the ribbon cassette*, page 33. **2.** Check whether the print head is damaged. To do so print out a status page (see *Printing out the status page*, page 53) and check if under the lines representing the software versions all 24 lines are present. Every line represents one of the 24 needles of the print head. If not so, replace the print head; see the chapter *Replacing the print head*, page 39.  **We recommend to use genuine ribbon cassettes only. In case of a damaged print head, please contact your dealer.**
Prints undefined characters	**1.** Check that the interface plug is correctly connected to the computer and to the printer. **2.** Check that the proper emulation and the correct character set is selected in the menu; see section *Emulation type*, page 61, *Epson*, page 62, *IBM*, page 62 and *Olivetti*, page 62. **3.** Check the length of the interface cable; see the chapter *Interfaces*, page 127.

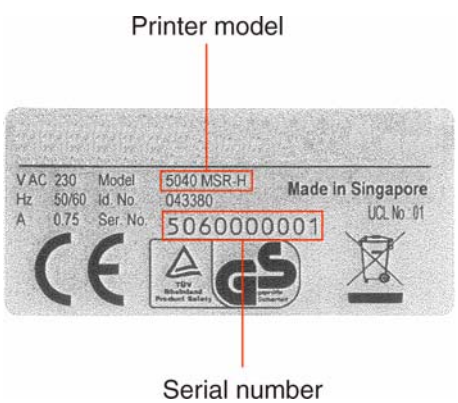
Error messages and warnings

Malfunctions are differentiated as warnings and errors. For a warning a message only appears on the LCD briefly.

As soon as the control logic of the printer detects an error, it aborts the printout and the Ready and the Paper indicators on the control panel starts to blink. An error message is issued on the LCD. The cause of this malfunction and the possible troubleshooting actions are listed in the following table.

Press the STOP/EJECT key or close the cover after eliminating the problem. The message **STOP NO PAPER** appears on the LCD. When you press the STOP/EJECT key again, the printer is switched to Online. The Ready indicator lights up and the message **ONLINE NO PAPER** appear on the LCD. The printer is ready to accept data from the system.

If our suggestions on the next pages are not sufficient to eliminate the problem, you should call the Customer Service. When reporting a problem to Customer Service you must specify the Serial number and the model type of the printer. Hold a status page with the current parameter settings in readiness.



You can read this on the type plate on the rear of the printer. The serial number is also printed out with the status page (top right).

All the functions of the printer are controlled by the system via the interface. You can check the printer functions by printing the current listings of setups.

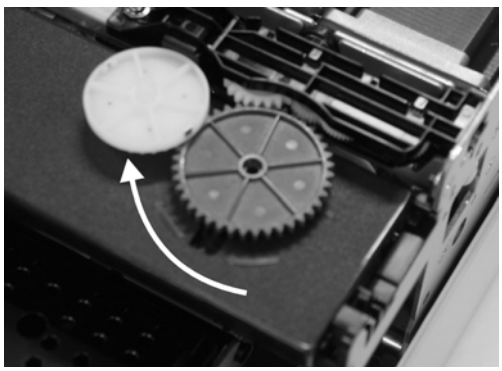
Unrecoverable errors

The following errors are unrecoverable by the user. If displayed in the LCD display, power the printer off and on again.

- CAM Error
- Carrier Error
- RAM Error
- ROM Error
- EPROM Error
- CG Error
- MSR-H Error
- Key Scan Error

If the error message appears again after you have repeatedly powered the printer off and on, contact your dealer or customer service.

Recoverable errors

Message	Condition	Corrective action
Print Head Hot Error	The print head is too hot.	▸ Power the printer off, open the cover and wait a few minutes. Then power the printer on again.
Ribbon Cassette Error	Either the ribbon cassette is not installed correctly, the ribbon is not functioning correctly or you are using a ribbon cassette of a different manufacturer.	▸ Check if the ribbon cassette is installed correctly (see section *Changing the ribbon cassette*, page 33). ▸ Check the function of the ribbon cassette. To do this, turn the green tension gear of the ribbon cassette in the direction of the arrow. Check if the ribbon itself will be moved.  ▸ Ensure that the green gear on the ribbon is correctly engaging with the white gear mechanism on the printer. Reseat the ribbon is necessary ▸ Only use original ribbon cassettes of the manufacturer.
Paper Length Error	**Epson/IBM emulation:** When printout is going across the bottom edge of a paper. **Olivetti emulation:** when printout will exceed the selected page length. (In case of Epson/IBM emulation paper will be ejected, if printout exceeds the page length.)	▸ When Reset Error Command or General Reset Command (PR2) is received, if there is no paper in the printer, the error message is canceled, and it is in an online state. ▸ If STOP Key is pressed, if there is no paper in the printer, it is in an offline (STOP) state, and the error message is canceled. ▸ May be resolved by switching parameter "Continuous print" to "on" in the menu. See chapter 8, parameter “Continuous Print” on page 59.

Message	Condition	Corrective action
Framing Error (Serial I/F)	The Stop bit is not detected by the serial interface. "?" is printed instead of the received data until the error is canceled.	▸ If STOP/EJECT key is pressed, the error message is canceled and the printer is in offline (STOP) state. ▸ Make sure the Baud rate, data bits and stop bits of the printer match the PC communications port settings.
Parity Error (Serial I/F)	The setting of Parity of the Host PC differs from the Parity setting of the serial interface of the printer. "?" is printed instead of the received data until the error is canceled.	▸ If STOP/EJECT key is pressed, the error message is canceled and the printer is in offline (STOP) state. ▸ Make the Parity settings of Host PC and printer compatible.
Overrun Error (Serial I/F)	The data sent by the serial interface exceed the currently prepared Overrun Buffer; the signal sent by the printer to the Host PC will be ignored. "?" is printed instead of the received data until the error is canceled.	▸ If STOP/EJECT key is pressed, the error message is canceled and the printer is in offline (STOP) state. ▸ Check the protocol and/or the hand-shake of the serial connection.
Cover Open Error	**Olivetti emulation:** the printer receives printing data, printing start, bit image or vertical position change command while the cover is open.	▸ When Reset Error Command or General Reset Command (PR2) is received, if the cover is closed, the error message is canceled, and it is in an online state. ▸ If STOP Key is pressed, if the cover is closed, the printer is in an online state, and the error message is canceled.
Cover Open Error	**Epson/IBM emulation:** If the cover is opened during the printing process, the print-out will stop and the LCD displays **Cover Open**. After closing the cover the message is deleted and the printer will continue the print-out. If paper is inserted in the printer without any print data and the cover is opened, the paper is ejected, the LCD displays the message **Remove Paper**.	▸ If the cover is closed, the printer is shifted to online state. ▸ If the cover is opened during other errors (e.g. Paper Jam Error, Paper Length Error) occur, the LCD message will not be changed. However, if the cover is closed in that error state, those errors will be canceled.

Warnings

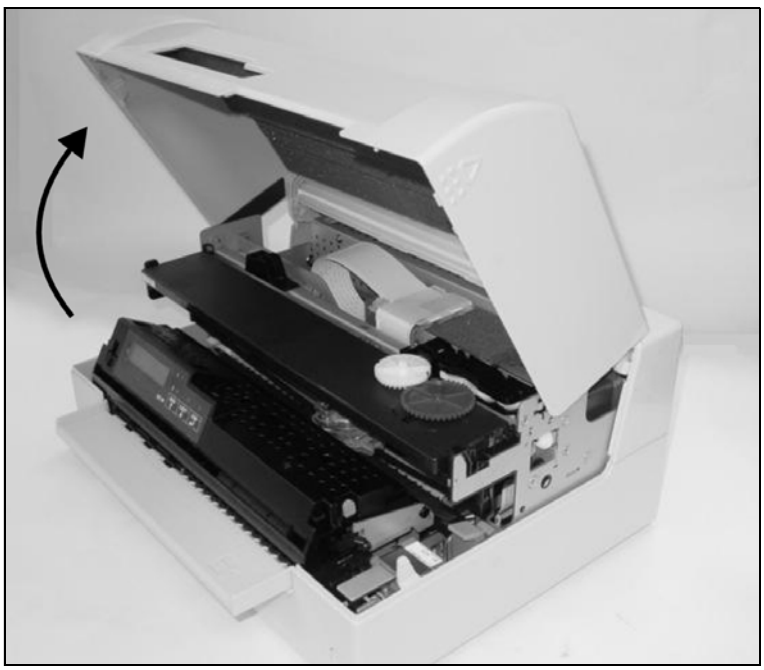
Message	Condition	Corrective action
Data in Buffer	USER 1 or **USER 2 key** is pressed in online state and there is data in the print buffer.	▸ When the above-mentioned condition occurs, LCD Message is displayed "Warning Data in buffer" for 3 second and it returns to the original state.Therefore, the function of pressed key is not performed.
Remove Paper	The paper detection sensor detects a paper after paper ejection was performed.	▸ When the ejected paper will be removed, the message disappears.

Clearing paper jams

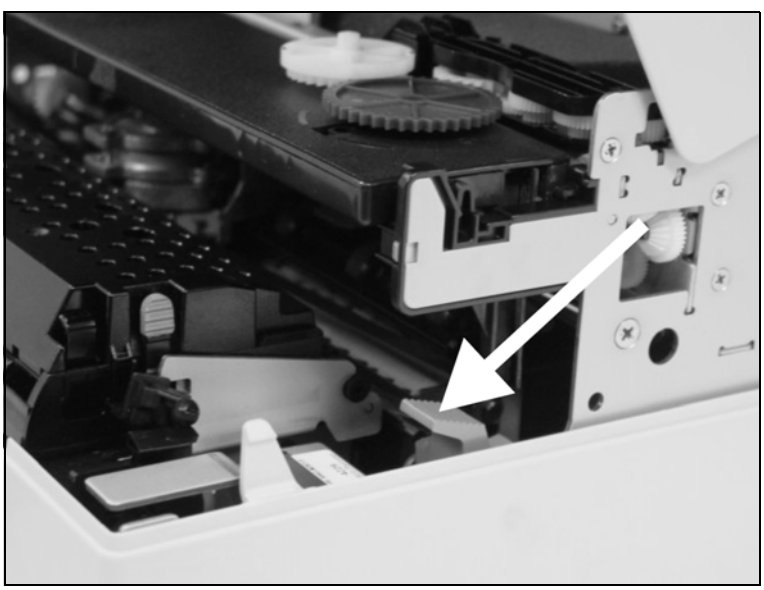
If a document which was fed into the printer is not automatically ejected or ejected after pressing the STOP/EJECT key on the control panel after its processing, a paper jam has occurred inside the printer and is displayd in the LCD display. The paper jam must be cleared manually.

STOP

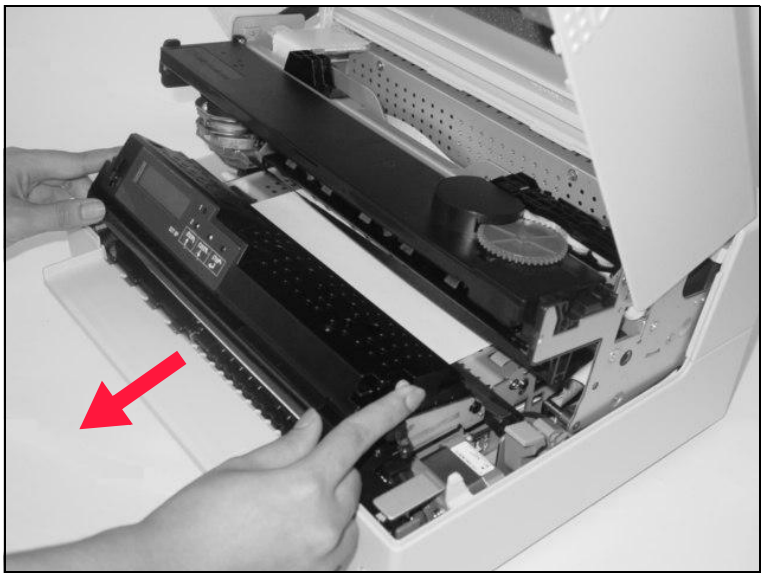
The print head may be hot if the printer has been printing for a long time. Wait until it has cooled down so that you are not in danger of being burnt.



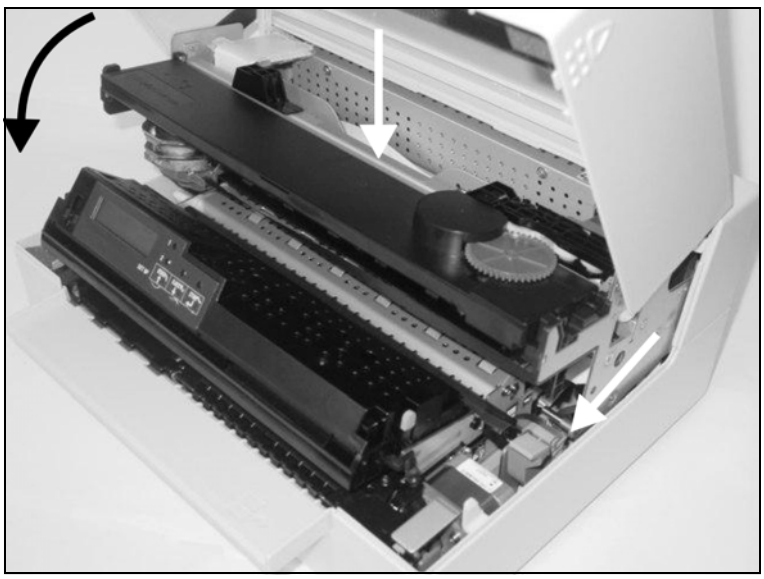
Open the cover by grasping it at the right and left-hand side and swing it upwards until it clicks into position.



Press the green release lever for the printing mechanism. This swings the printing mechanism backwards.



Press the two green release levers on both sides of the panel and lift the panel up. Then remove the jammed paper by pulling it in direction of the arrow out of the printer.



Close the main frame by pressing the colored section in the middle of the frame as shown by the white arrow and ensure both left and right hand sides of the frames are fully latched.

Close the cover. The printer is now ready to operate and to be switched on again.

We recommend to check the printer's operation by performing a printout of the parameter settings (see section *Printing out the status page*, page 53).

10 Care and maintenance

The printer is designed to operate with minimal maintenance. It is advisable to clean the inside of the printer from time to time with a vacuum cleaner.

STOP **Before cleaning, turn off the printer, wait 5 to 10 seconds and disconnect the power cable.**
Do not oil or grease the printer, especially the sliderails and shafts.

Cleaning the housing

Clean the printer housing with mild detergent (use a dishwashing liquid, if necessary, or a plastic cleaning agent) and a soft lint-free cloth.

Take care not to pour any liquid into the ventilation slots of the housing.

STOP **Do not use abrasive cleaners. Never use solvents or alcohol.**

Cleaning the interior

Switch the printer off before you start cleaning the interior and remove the mains plug for your own safety.

Proceed as follows to remove any paper dust that has accumulated in the printer:

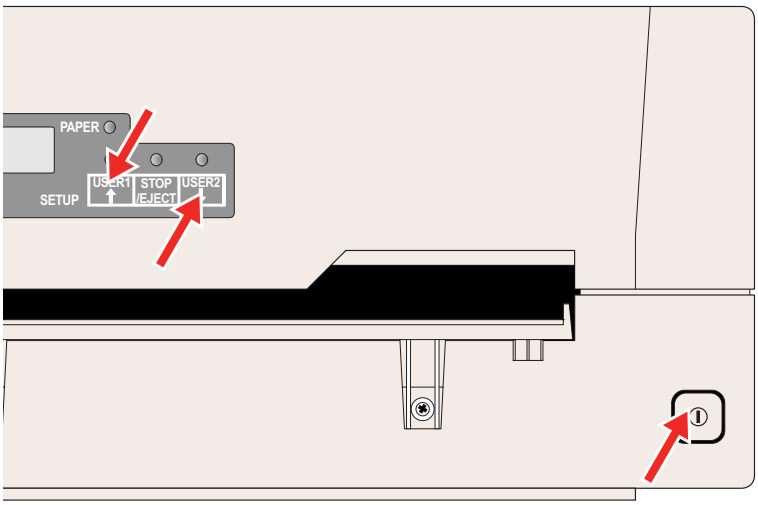
1. Open the printer and remove the ribbon cassette (see the section *Removing the ribbon cassette*, page 33).
2. Push the print head completely aside so that the area below can also be cleaned.
3. Use a special vacuum cleaner, which is also used for cleaning optical equipment, or a soft brush to remove the paper dust.

STOP **Never use any chemical liquids to clean the platen or the rollers.**

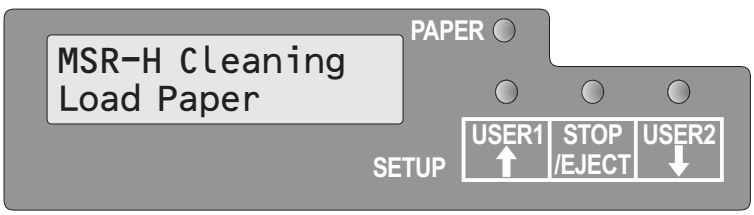
4. Re-insert the ribbon cassette after completing the cleaning and close the printer (see the section *Inserting the ribbon cassette*, page 35).
5. Connect the printer by inserting the power plug into the wall socket.

Cleaning the MSR-H magnetic stripe

If your printer has an MSR magnetic stripe reader, the MSR read/write head can be cleaned with a special cleaning sheet as follows.



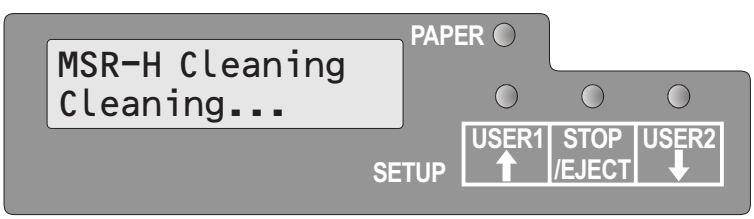
Press the **USER 1** and **USER 2 key** and keep the key pressed while switching on the printer.



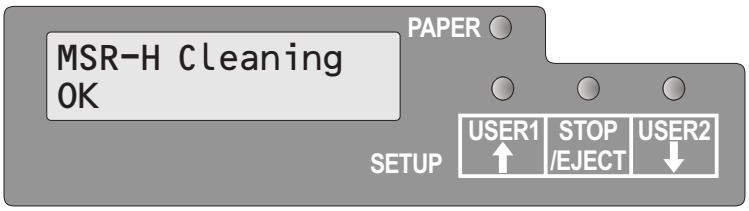
The message **MSR-H Cleaning Load paper** appears on the LCD display.

Insert the special MSR-H cleaning sheet at the right side of the printer.

The cleaning routine starts at once.

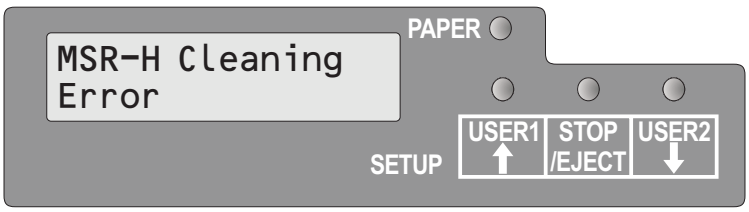


The message **MSR-H Cleaning Cleaning…** appears on the LCD.

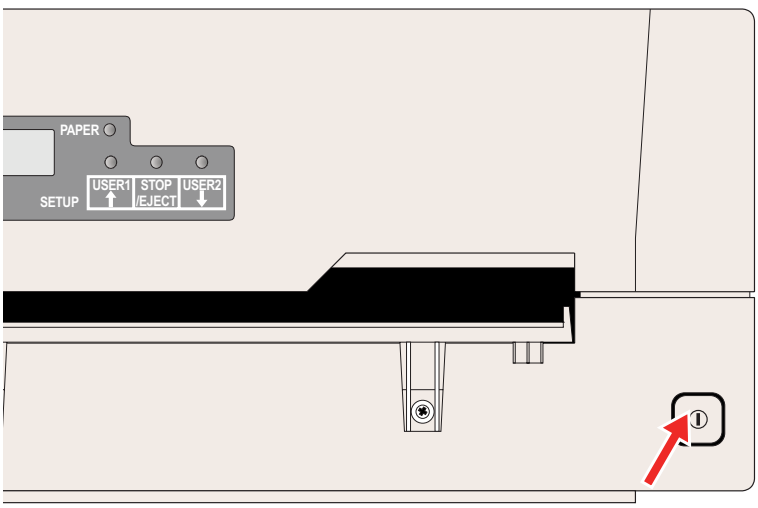


After finishing the cleaning process the LCD displays the Message **MSR-H Cleaning OK**.

You can repeat the cleaning routine by pressing the STOP/EJECT key.



If an error occurs during the cleaning process, the LCD displays the message **MSR-H Cleaning Error** after the cleaning action has ended.



Switch the printer off and on again in order to set the printer in the normal operating mode.

The cleaning sheet can be used several times.

Transport of the printer

Preparations for transport

If you intend to transport the printer over a short distance only, ensure that it has been switched off correctly.

Never remove the mains plug when you can still hear mechanical noise.

Make sure that the printer is transported horizontally. Don't tilt the printer nor put it upside down. Keep the packaging for future transportation.

Shipping the printer

When shipping the printer, the printer and its accessories must be properly packed. If your carton or packing material is lost, contact your dealer or service representative.

Properly packing the printer requires all the original packing materials.

1. Turn off the power switches of the printer and the host computer. Disconnect the power cord from the printer.
2. Disconnect the interface cable.
3. Remove the ribbon cassette (refer to section *Removing the ribbon cassette*, page 33).
4. Pack the printer and accessories in the shipping carton (refer to section *Unpacking the printer*, page 5).

A Specifications

Printer specifications

Printer system	Serial impact matrix printer Printhead with 24 needles Diameter 0.22 mm
Print speed	
Draft (High Speed)	CPI CPS 10 400 12 480 15 600 16.6 400 17.1 342 20 400
Draft (Normal)	CPI CPS 10 300 12 360 15 400 16.6 200 17.1 228 20 266
Letter Quality (High Speed)	CPI CPS 10 133 12 160 15 200 16.6 200 17.1 228 20 266
Letter Quality (Normal)	CPI CPS 10 100 12 120 15 150 16.6 150 17.1 171 20 171
Tab speed	10 IPS (Inches Per Second) max.
Print width	94 characters/line at 10 cpi 112 characters/line at 12 cpi 141 characters/line at 15 cpi

Character pitch	10, 12, 15, 17.1, 20 and 24 (16.6 only for PR2)
Fonts **Standard CG**	Draft: Draft, Draft Banking LQ: Courier, Roman, Sans Serif, Script, OCR-A[1)], OCR-B
Optional CGs	Bold, Gothic, Prestige Elite, Orator
	1) If OCR-A font is selected, the code page will automatically select DIN as code page.
Emulations	Epson ESC/P (T5023, HPR4915) IBM 4722 (including Proprinter XL24E) Olivetti PR2E, PR50, PR2845
Resolution	Horizontal 120 to 360 dpi Vertical 180 dpi
Print attributes in all character pitches	Emphasized Super/Subscript Italic Double-strike Double-width Double-height Underline Overscore
Line spacing	5 / 6 / 8 lpi Optional in microsteps n/60 inches n = 0 to 127 n/180 inches n = 0 to 255 n/360 inches n = 0 to 255
Nominal voltage	120 V ± 10%, 230 V ± 10%
Line frequency	50/60 Hz ± 3%
Network form	For use in power distribution systems with neutral and protective earth conductors (TN)

Rated current intake	Operation (maximum): US: 1.30 A; EU: 0.59 A Standby: US: 0.11 A; EU: 0.072 A
Apparent power consumption	Operation (maximum): US: 89.7 VA; EU: 93.6 VA Standby: US: 8.8 VA; EU: 11.4 VA
Noise **Sound output level** **Sound pressure level**	 L_{WAd}: 7.1 dB in operation L_{pAm}: 55 dB in operation
Paper feed	Friction feed
MTBF **(Mean Time Between Failures)**	10,000 power on hours at 25% DC (duty cycle)
Dimensions	Height: 168 mm Width: 378 mm Depth: 280 mm
Weight	Standard = 9.10 kg, MSR-H = 9.95 kg
Service life **Print head** **Ribbon**	 300 million dots/pin (normal copy mode) 10 million characters in DRAFT10 cpi
Environmental stress test	
Operation **Low temperature** 14 h online at 5°C 2 h online at 5°C **Dry temperature** 14 h online at 40°C/30% RH 2 h function test at 40°C/30% RH **High humidity (steady state)** 46 h online at 30°C/85% RH 2 h function test at 30°C/85% RH	 EN60068-2-1 +A2: 1994 (IEC 68-2-1 +A1/A2) Group A EN60068-2-2 +A2: 1994 (IEC 68-2-2 +A2) Group B EN60068-2-3: 1969 Group Ca
Storage and transport **Low temperature** 16 storage at –20°C **Dry temperature** 96 h storage at 60°C/30% RH **High humidity (steady state)** 96 h storage at 40°C/93% RH	 EN60068-2-1 +A2: 1994 Group A EN60068-2-2 +A2: 1994 Group B EN60068-2-3: 1969 Group Ca

Approvals	DIN EN 60 950 / VDE 0805, TUV (EN 60950) / Certified CE Mark, UL 60950 3rd Edition / C-UL (CSA C22.2 No 60950-00) new reversion, IEC 60950-1, EN 55022:1998 (Class B), EN 55024: 1998, FCC PT 15B : 2000 (Class B), EN61000-3-2:2000, EN61000-3-3:1995

Paper specifications

Single and multi-copy sheet		
Paper width	70 to 240 mm	
Paper length	70 to 500 mm	
Paper weight	Single sheet: Multi sheet:	60 to 160 g/m^2 80 to 260 g/m^2
Paper thickness	Single sheet: Multi sheet:	0.08 to 0.5 mm 0.08 to 0.5 mm
Number of copies	Original + four copies (Copy mode)	
Passbook		
Paper width	Open book	105 to 235 mm (Horizontal stitch type) 105 to 235 mm (Vertical stitch type)
Paper length	Open book	140 to 210 mm (Horizontal stitch type) 125 to 210 mm (Vertical stitch type)
Corner radius	0 to 10 mm	
Cover thickness	0.2 to 0.5 mm	
Passbook thickness	2.0 mm max. (one cover + inner page)	
Thickness difference	1.4 mm max.	
Paper weight	75 to 120 g/m^2	
Book condition	Recommend to be flattened carefully before insertion.	
Multi-copy sheets	Sets of forms may be used only if the top edge is bound. The binding edge should be as soft as possible. A wavy binding edge may hamper the smooth feeding of these sets. Multi-part forms have to be inserted with the glued top facing down. Multi-part forms should be tested for suitability.	

Paper quality	Light pulp paper of medium fine quality, paper bearing the quality mark SM Post and photocopy paper are suitable for use. Unsuitable are: satin-finish or coated papers, imitation art papers, and embossed papers. Since paper as natural material reacts strongly to environmental influences (e.g. humidity, temperature), the place of storage should be selected carefully. We recommend that this kind of paper should be tested extensively before larger quantities are acquired. Should papers with a dark reverse side be used, these should also be tested for their functionality. Please pay attention to the use of infrared reflecting colors, when acquiring these papers.
Passbooks	Passbooks shall be free of any metallic parts such as staples or metal clips. Adhesion of any form of stamps or seals is prohibited, as the reliability will be impaired. Passbooks should not have any pages of a smaller size than the cover pages. Passbooks should have no tears, creases, folds or loose stitched. Level the pages before use at the time when you open a folded passbook. Warp of pages will degrade the reliability. When you open a folded passbook, curve forms where the pages are bound in the center of the passbook. If the curved part is too large, such passbooks may be not used.

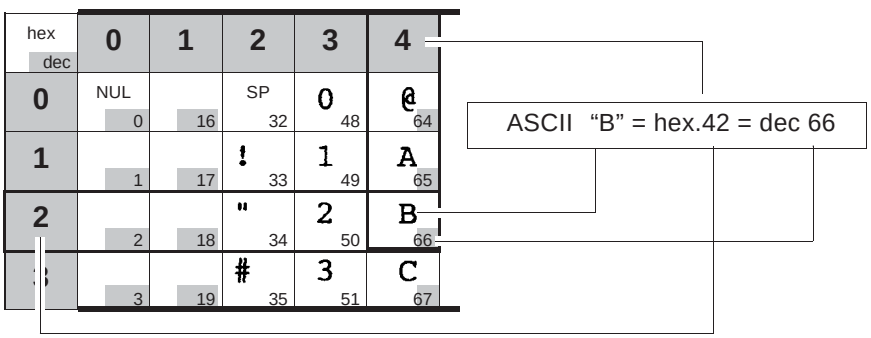
Interface specifications

Parallel interface	bidirectional
Type of data transmission	8-bit parallel interface (Centronics compatible) IEEE-1284; Nibble and ECP mode
Transmission rate	Max. 30 KHz
Signal status	Low: 0.0 V to +0.4 V High: +2.4 V to +5.0 V
Connection cable	Material: AWG 28 at least Length: up to 2.0 m Twisted-pair cable with double-shield, acc. IEEE Std 1284 – 1294
Voltage supply of external devices on pin 18	U = +5 V ±10% I = 0.5 A_{max}
Interface connections	Printer side: Amphenol 57-40360, 36-pin (or compatible) Cable side: Amphenol 57-30360, 25-pin (or compatible)
Capacity of data buffer	32 KB max.
Serial interface	RS232C interface
Synchronization	Asynchronous
Transmission rate	4,800 bauds to 38,400 bauds
Signal status	OFF = Mark = log.1 = –3 V to –15 V ON = Space = log. 0 = +3 V to +15 V
Connection cable	Length up to 15 m
Interface connections	ITT Cannon connector, series DB-9m S
Transmission protocol	XON/XOFF, READY/BUSY
Capacity of data buffer	32 KB max.
USB interface	USB 2.0 Full mode (12 MHz)

B Character sets

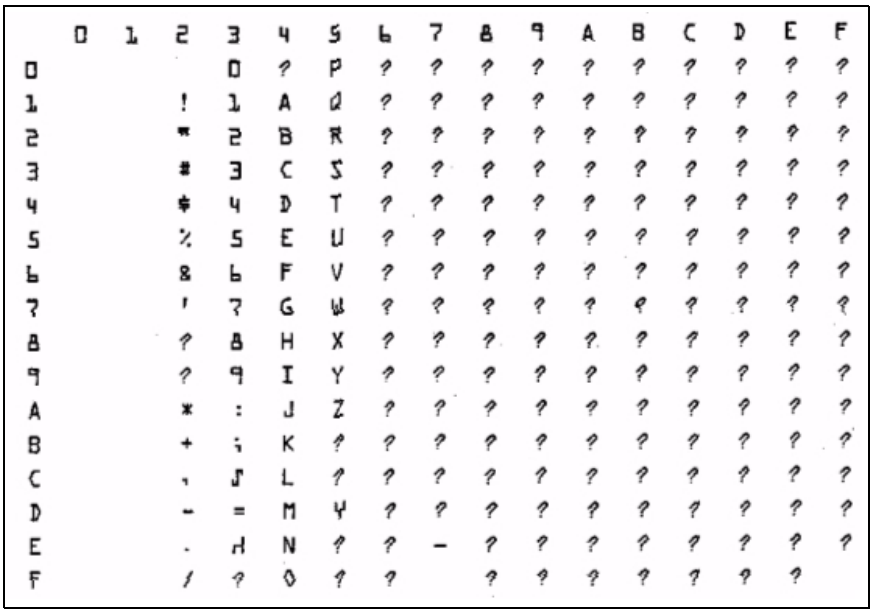
This chapter shows the character sets and contains a list of all available character sets which can be selected via control panel or by escape sequences.

The following example shows you how to find the hexadecimal value for a character from the symbol set tables.



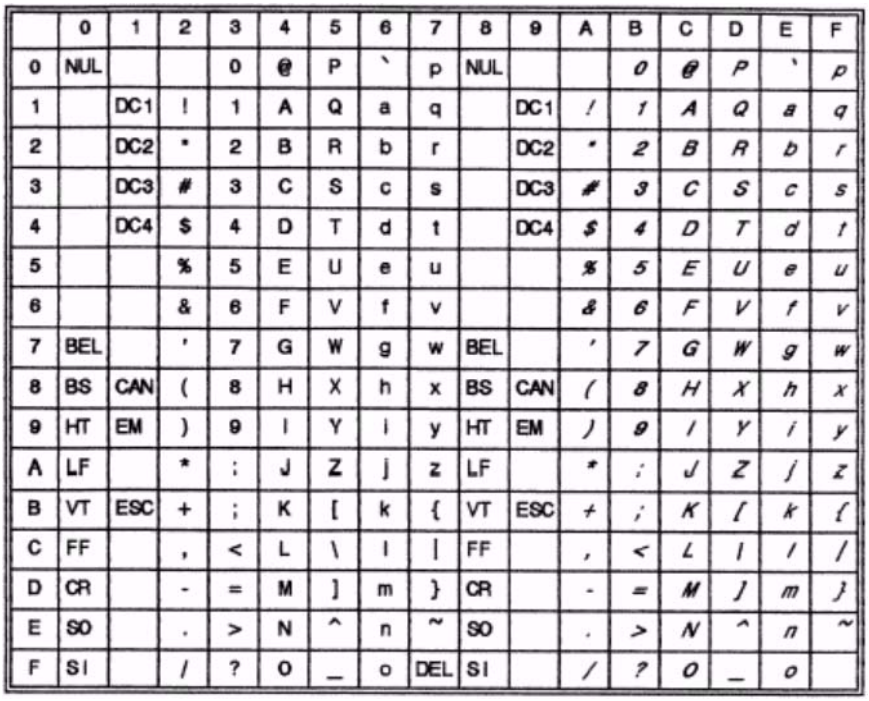
The fonts available depend on the installed character generator. For more information on character generators, refer to *Loading firmware*, **page 15**

OCR-A character set



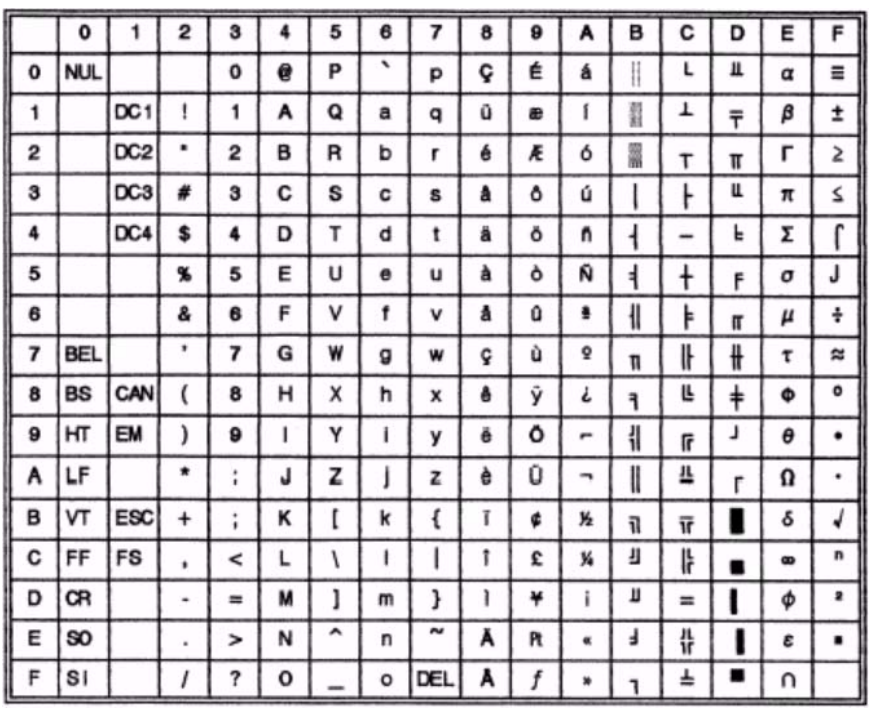
Epson character sets

Italic



	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL			0	@	P	`	p	NUL			0	@	P	`	p
1		DC1	!	1	A	Q	a	q		DC1	!	1	A	Q	a	q
2		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r
3		DC3	#	3	C	S	c	s		DC3	#	3	C	S	c	s
4		DC4	$	4	D	T	d	t		DC4	$	4	D	T	d	t
5			%	5	E	U	e	u			%	5	E	U	e	u
6			&	6	F	V	f	v			&	6	F	V	f	v
7	BEL		'	7	G	W	g	w	BEL		'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y	HT	EM	)	9	I	Y	i	y
A	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{	VT	ESC	+	;	K	[	k	{
C	FF		,	<	L	\	l	|	FF		,	<	L	\	l	|
D	CR		-	=	M	]	m	}	CR		-	=	M	]	m	}
E	SO		.	>	N	^	n	~	SO		.	>	N	^	n	~
F	SI		/	?	O	_	o	DEL	SI		/	?	O	_	o	

Graphic1



	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL			0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1		DC1	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2		DC2	"	2	B	R	b	r	é	Æ	ó	▒	┬	╥	Γ	≥
3		DC3	#	3	C	S	c	s	â	ô	ú	▒	├	╙	π	≤
4		DC4	$	4	D	T	d	t	ä	ö	ñ	▒	─	╘	Σ	⌠
5			%	5	E	U	e	u	à	ò	Ñ	▒	┼	╒	σ	⌡
6			&	6	F	V	f	v	å	û	ª	▒	╞	╓	μ	÷
7	BEL		'	7	G	W	g	w	ç	ù	º	▒	╟	╫	τ	≈
8	BS	CAN	(	8	H	X	h	x	ê	ÿ	¿	▒	╚	╪	Φ	°
9	HT	EM	)	9	I	Y	i	y	ë	Ö	⌐	▒	╔	┘	Θ	•
A	LF		*	:	J	Z	j	z	è	Ü	¬	▒	╩	┌	Ω	·
B	VT	ESC	+	;	K	[	k	{	ï	¢	½	▒	╦	╬	δ	√
C	FF	FS	,	<	L	\	l	|	î	£	¼	▒	╠	▀	∞	n
D	CR		-	=	M	]	m	}	ì	¥	¡	▒	═	▌	φ	²
E	SO		.	>	N	^	n	~	Ä	₧	«	▒	╬	▐	ε	■
F	SI		/	?	O	_	o	DEL	Å	ƒ	»	▒	╧	■	∩	

Graphic2

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL			0	@	P	`	p	NUL		á	⁞	└	╨	α	≡
1		DC1	!	1	A	Q	a	q		DC1	í	▒	┴	╤	β	±
2		DC2	"	2	B	R	b	r		DC2	ó	▓	┬	╥	Γ	≥
3		DC3	#	3	C	S	c	s		DC3	ú	│	├	╙	π	≤
4		DC4	$	4	D	T	d	t		DC4	ñ	┤	─	╘	Σ	⌠
5			%	5	E	U	e	u			Ñ	╡	┼	╒	σ	⌡
6			&	6	F	V	f	v			ª	╢	╞	╓	μ	÷
7	BEL		'	7	G	W	g	w	BEL		º	╖	╟	╫	τ	≈
8	BS	CAN	(	8	H	X	h	x	BS	CAN	¿	╕	╚	╪	Φ	°
9	HT	EM	)	9	I	Y	i	y	HT	EM	⌐	╣	╔	┘	θ	•
A	LF		*	:	J	Z	j	z	LF		¬	║	╩	┌	Ω	·
B	VT	ESC	+	;	K	[	k	{	VT	ESC	½	╗	╦	█	δ	√
C	FF	FS	,	<	L	\	l	|	FF	FS	¼	╝	╠	▄	∞	ⁿ
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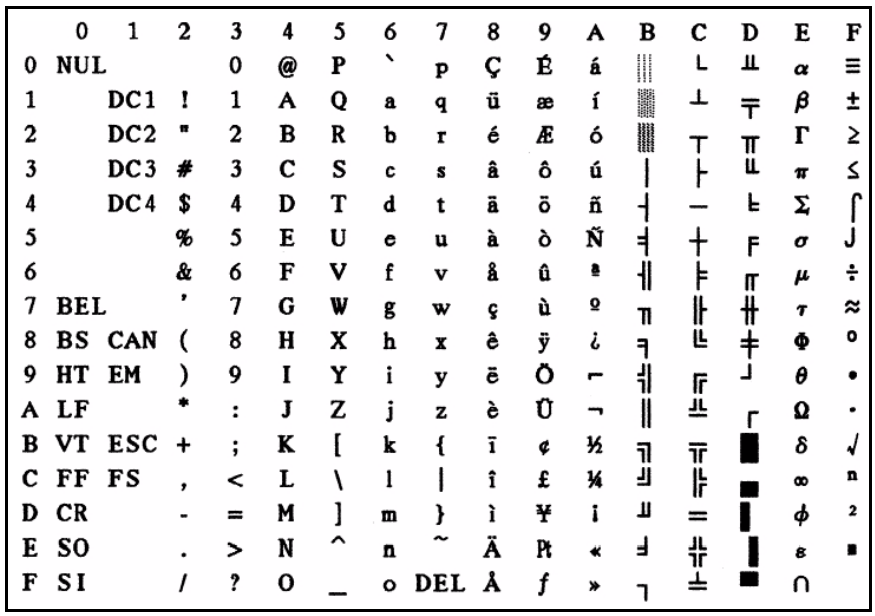

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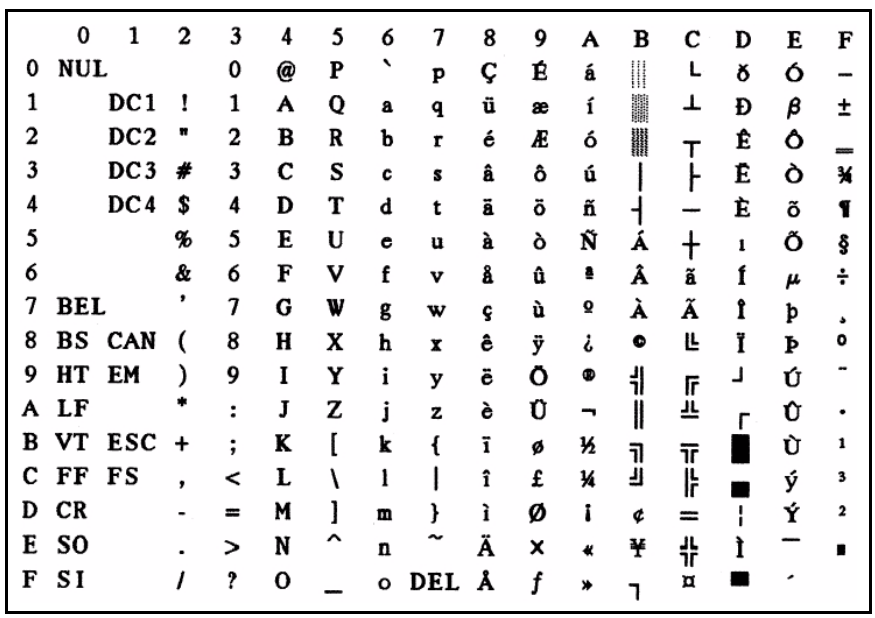

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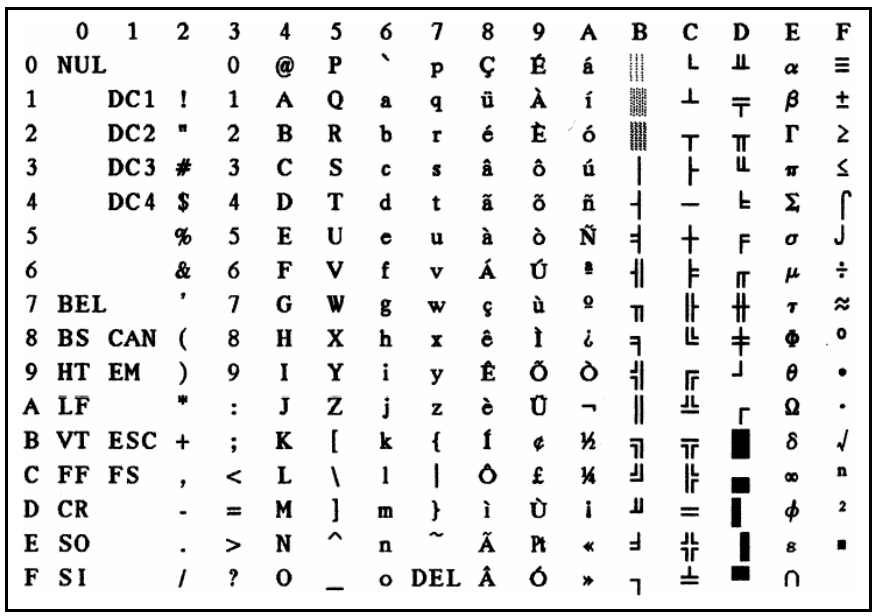

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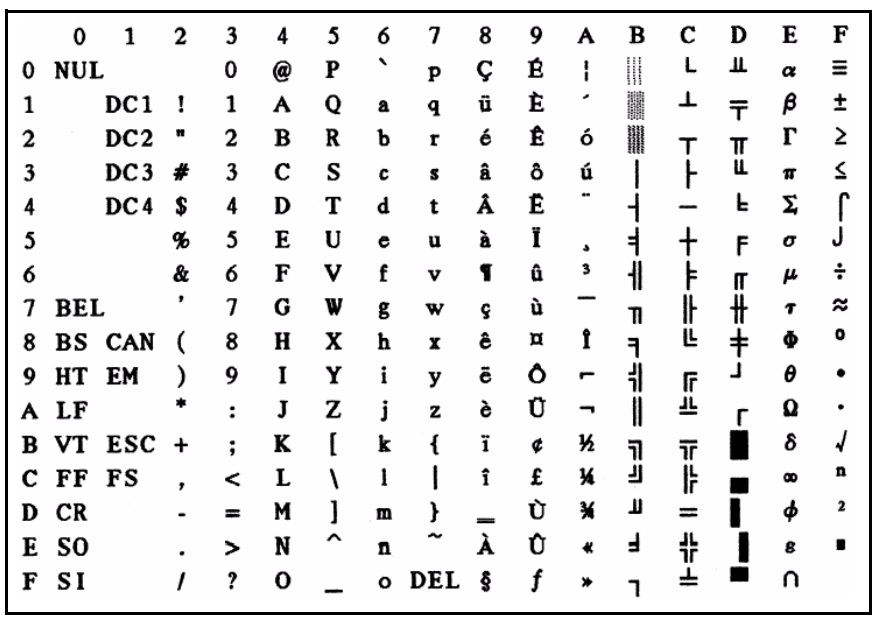

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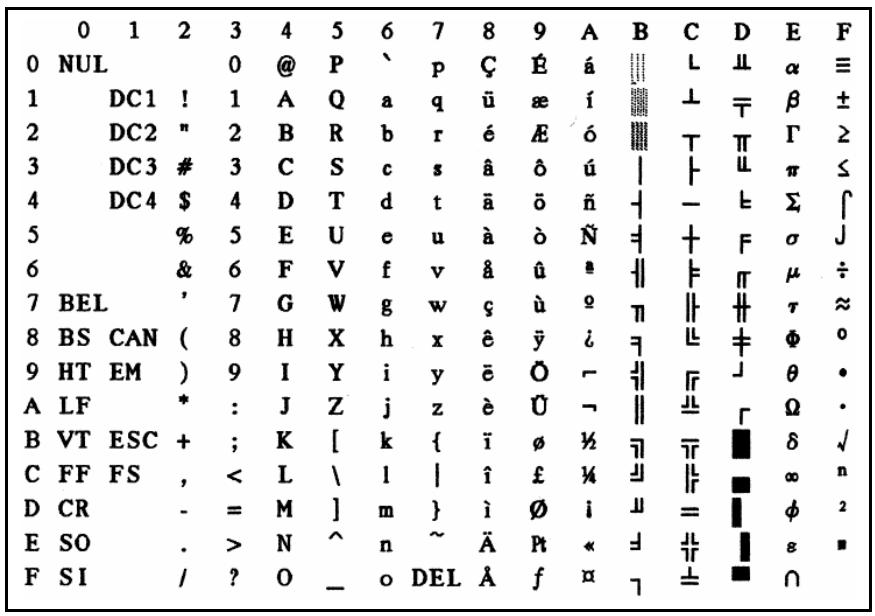

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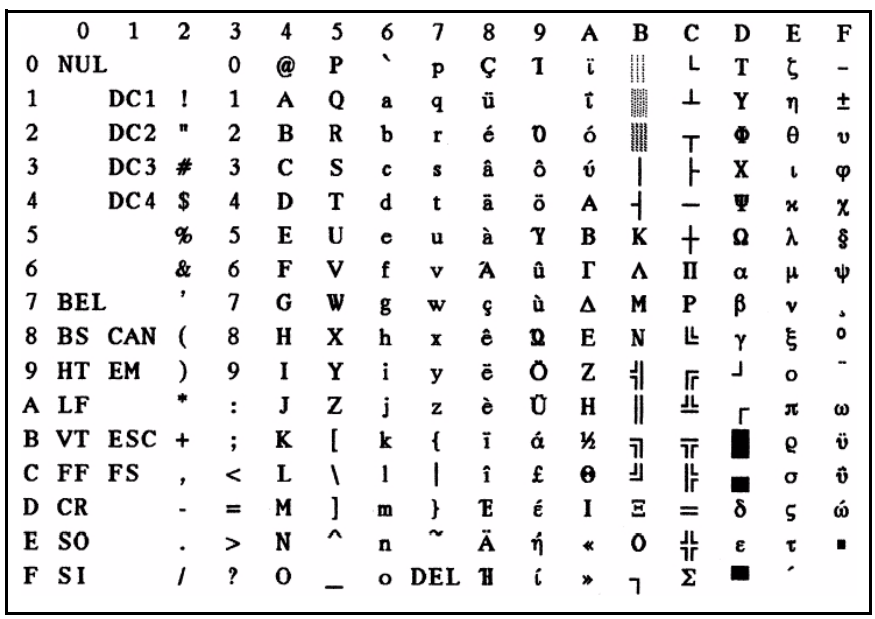

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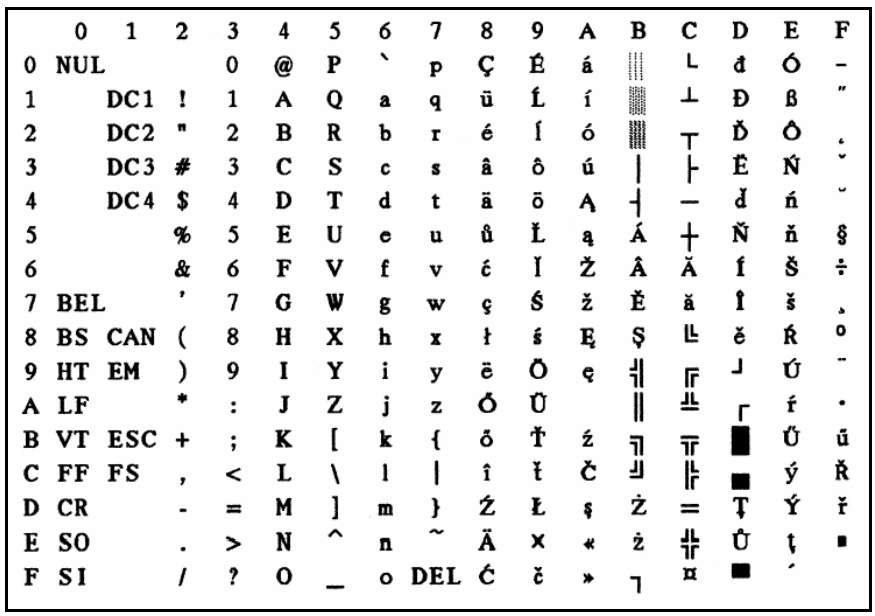

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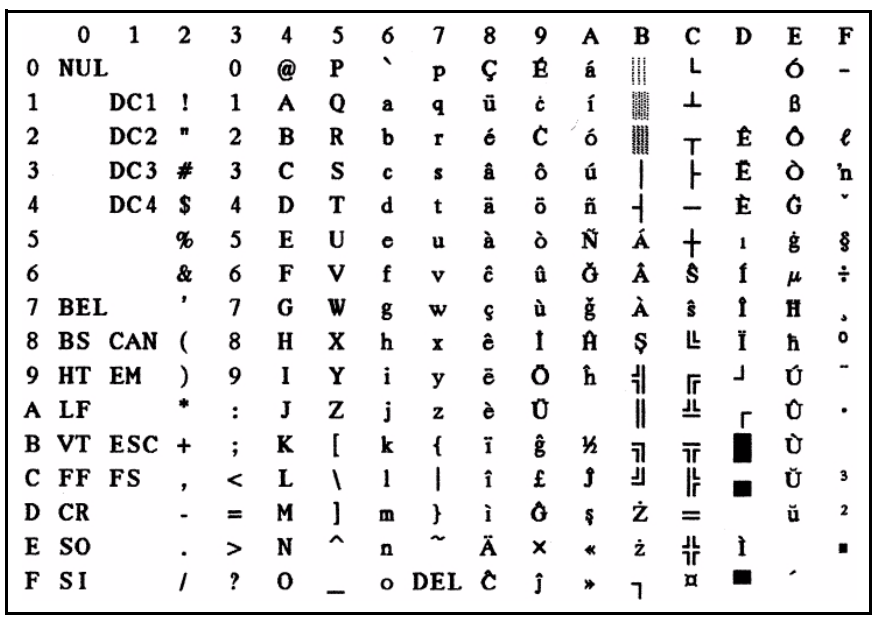

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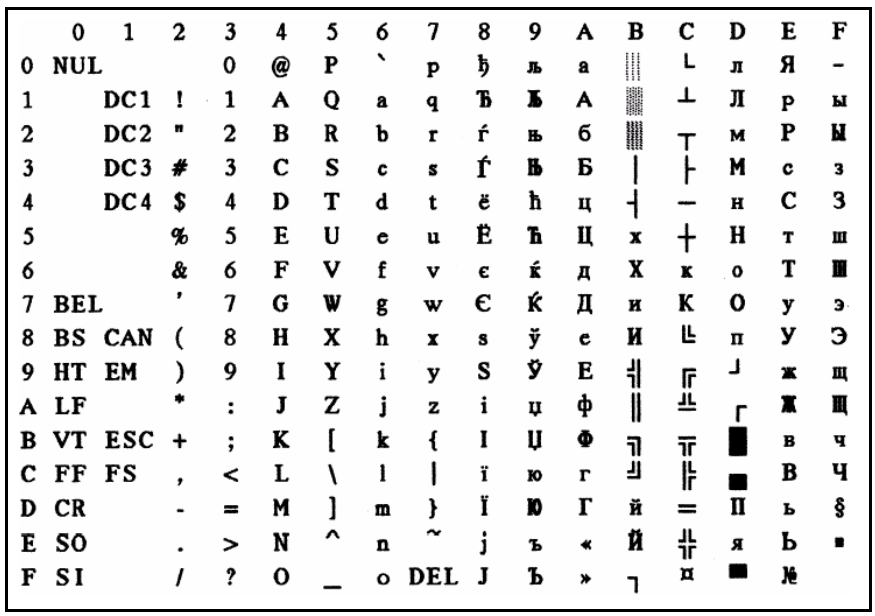

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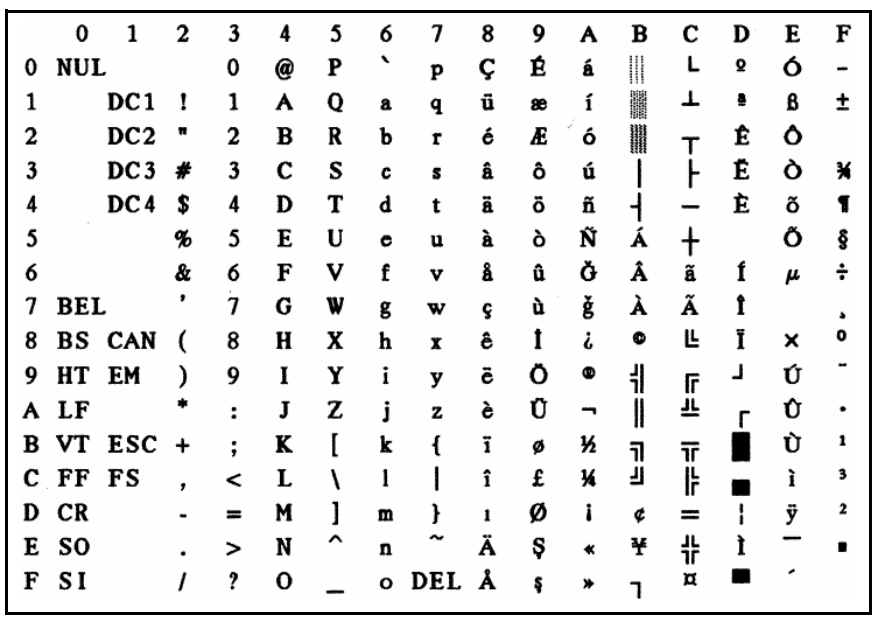

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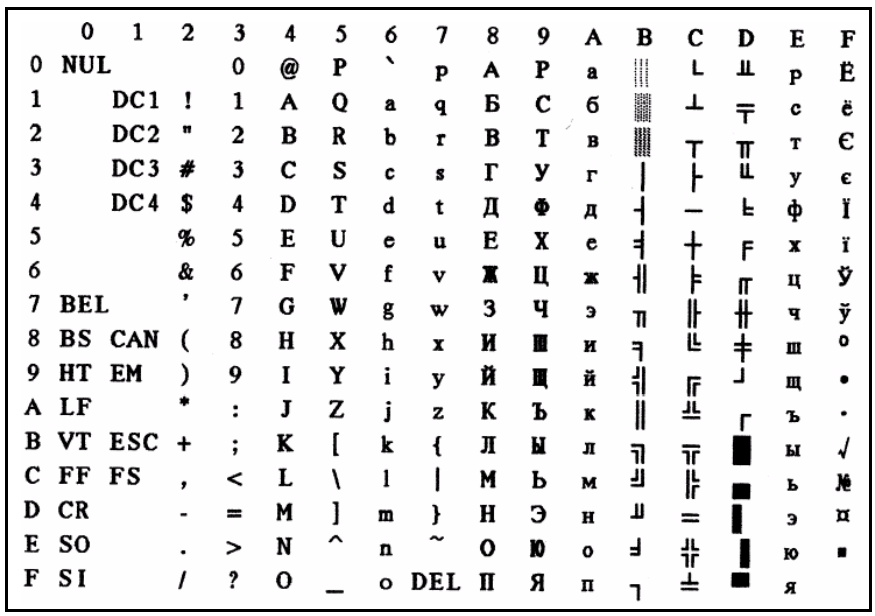

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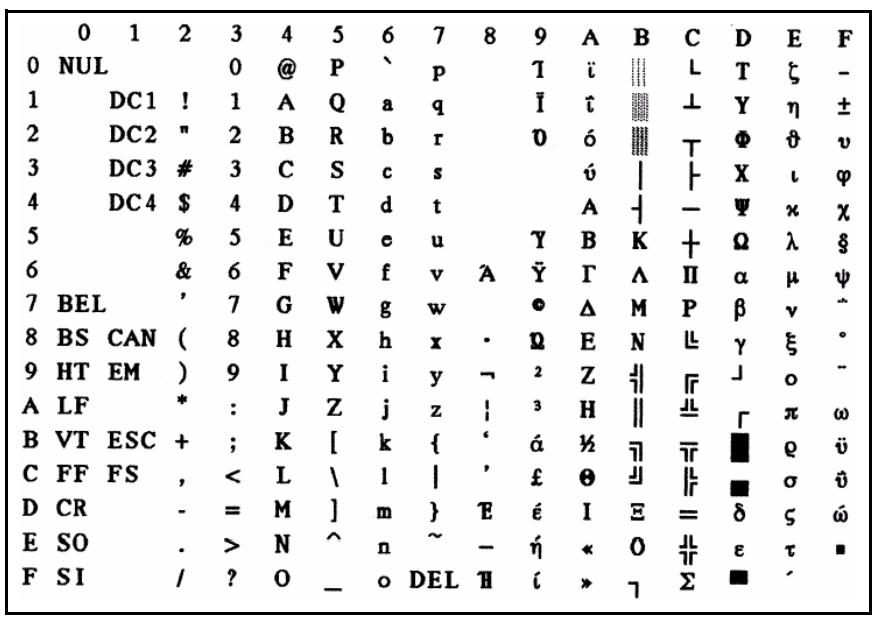

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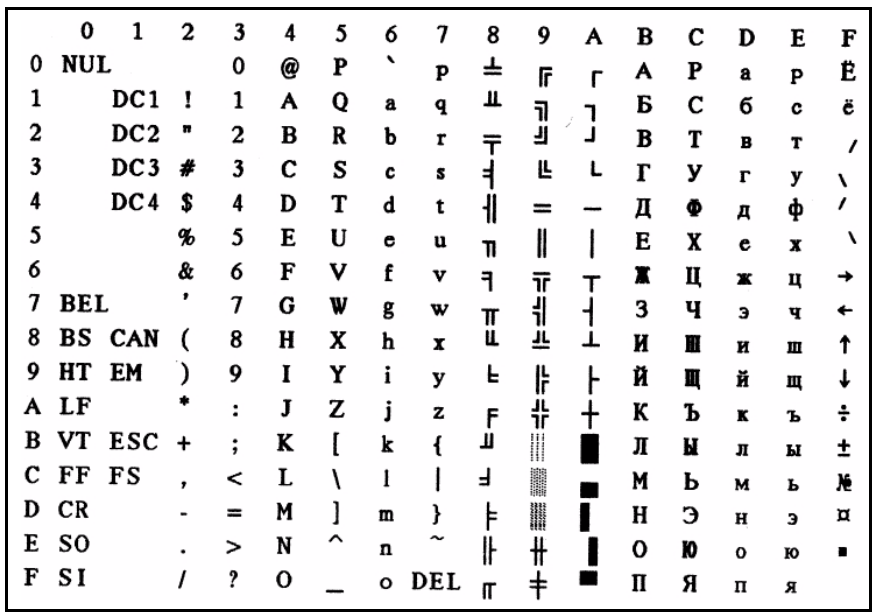

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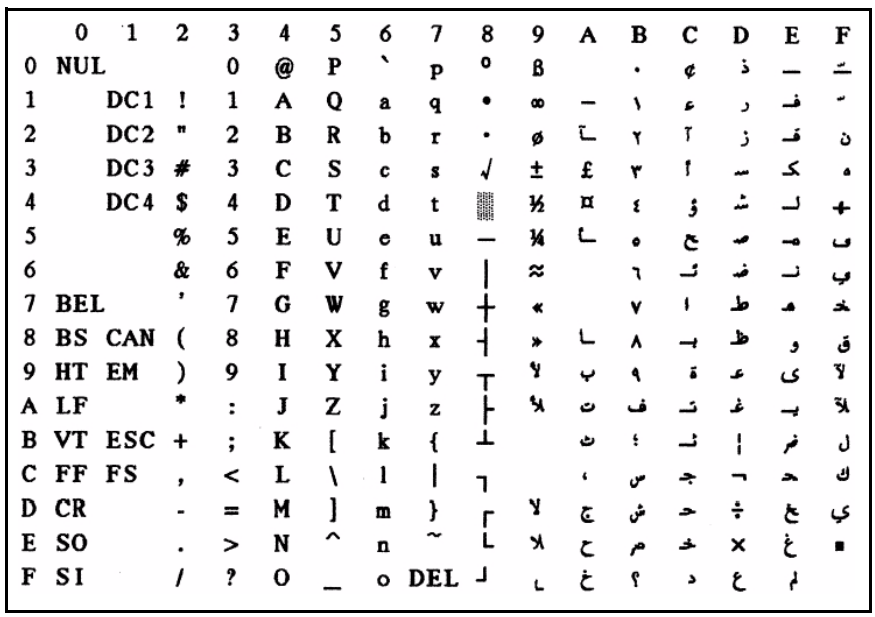

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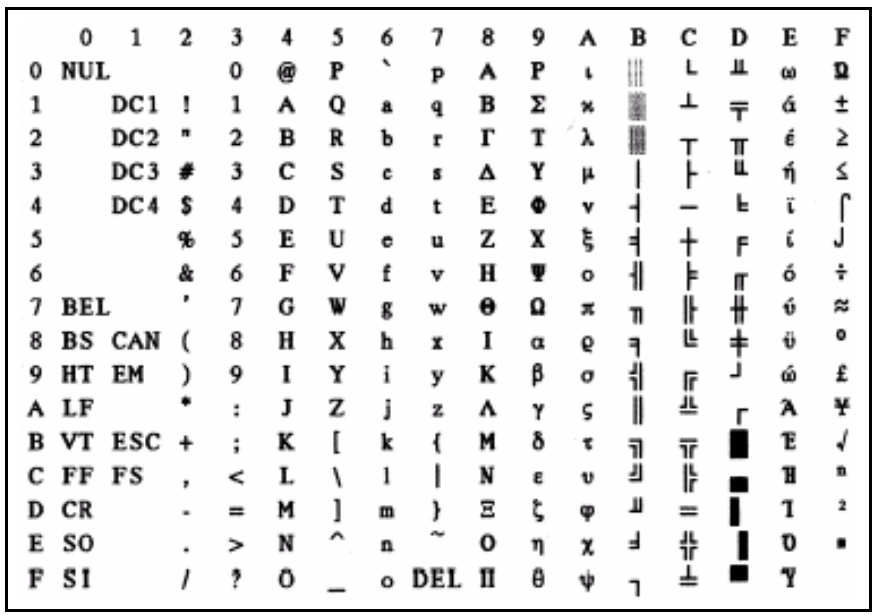

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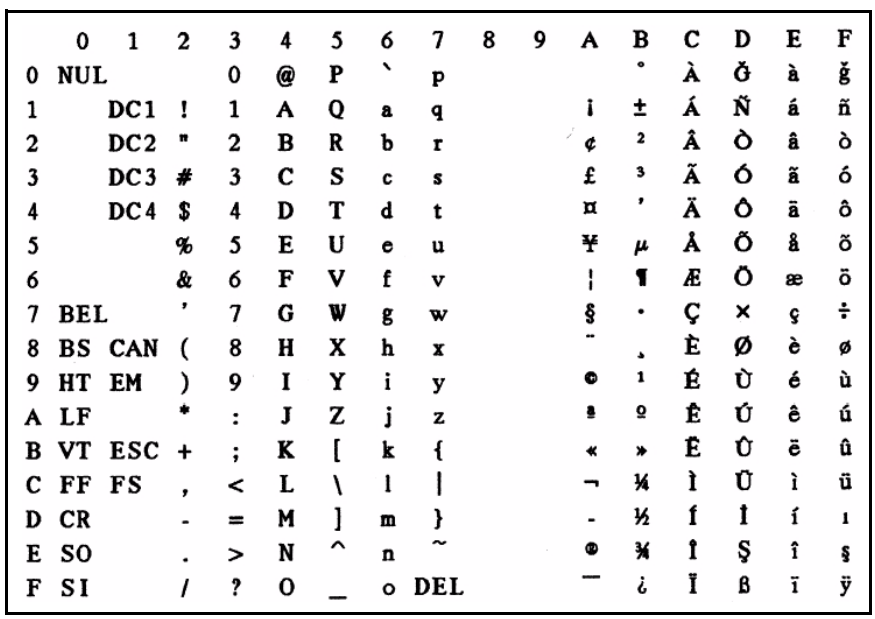

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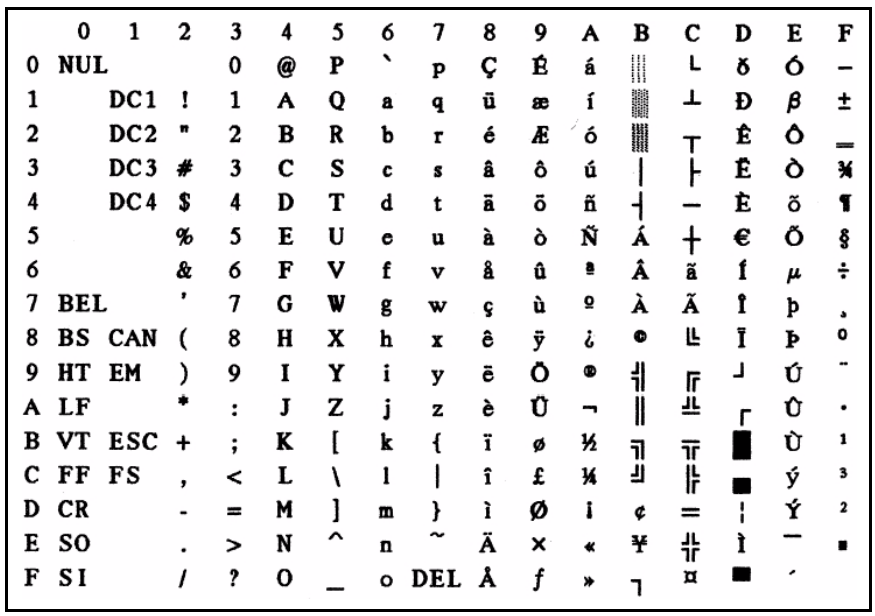

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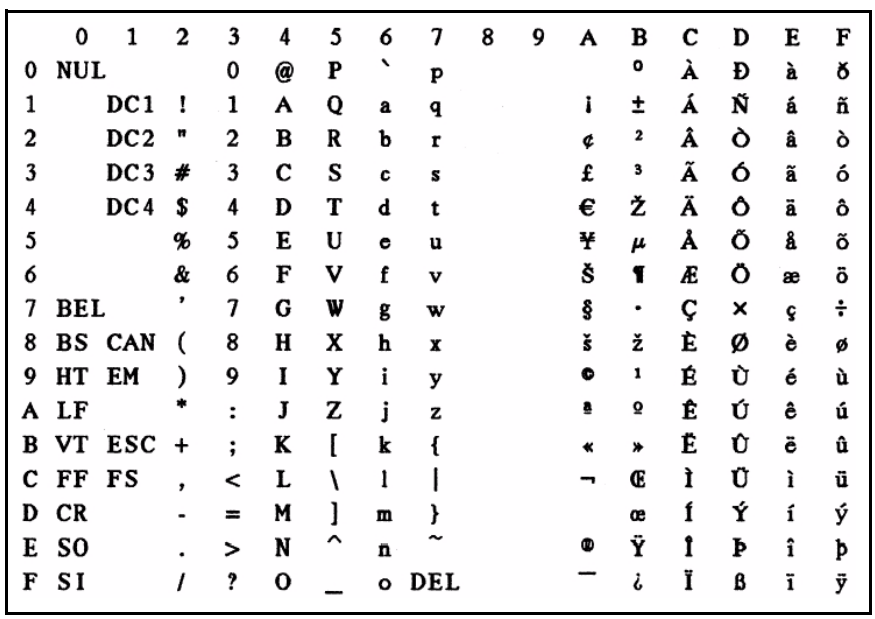

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4		DC4	$	4	D	T	d	t			¤	´			ה	פ
5			%	5	E	U	e	u			¥	µ			ו	ץ
6			&	6	F	V	f	v			¦	¶			ז	צ
7	BEL		’	7	G	W	g	w			§	·			ח	ק
8	BS	CAN	(	8	H	X	h	x			¨	¸			ט	ר
9	HT	EM	)	9	I	Y	i	y			©	¹			י	ש
A	LF		*	:	J	Z	j	z			×	÷			ך	ת
B	VT	ESC	+	;	K	[	k	{			«	»			כ	
C	FF	FS	,	<	L	\	l	|		¬	¼			ל	
D	CR		-	=	M	]	m	}			-	½			ם	
E	SO		.	>	N	^	n	~			®	¾			מ	
F	SI		/	?	O	_	o	DEL			¯			‗	ן	

Available code pages and fonts

The following list includes all the character sets you can select from the control panel or via ESC sequences and specifies the fonts in which they are available.

The printer does not support all code pages in all the fonts. See the Code page table and notes.

❶ The Roman typeface is selected on these code pages.

❷ The OCR-B typeface are available on ASCII character set and a part of character of code page 437, 850, 860, 863, 865 and 858. OCR-B font is able to be printed by Euro Symbol character.

❸ OCR-A character set is prior to any code page or nationality.

Code page/Font	Draft	Draft Banking	Roman	Sans Serif	Courier	Bold	Prestige	Script	Orator	Orator-S	Gothic	OCR-A	OCR-B
CP 437	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❷
CP 850	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❷
CP 860	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❷
CP 863	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❷
CP 865	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❷
CP 851	✓	✓	✓	✓	✓	✓	❶	❶	❶	❶	❶	❸	❶
CP 852	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❶
CP 853	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❶
CP 855	✓	✓	✓	✓	✓	✓	❶	❶	❶	❶	❶	❸	❶
CP 857	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❶
CP 866	✓	✓	✓	✓	✓	✓	❶	❶	❶	❶	❶	❸	❶
CP 869	✓	✓	✓	✓	✓	✓	❶	❶	❶	❶	❶	❸	❶
CP 437G	✓	✓	✓	✓	✓	✓	❶	❶	❶	❶	❶	❸	❶
USSR GOST	✓	✓	✓	✓	✓	✓	❶	❶	❶	❶	❶	❸	❶
CP 920 (equivalent to ISO 8859-9)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❶
CP 858	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❷

Code page/Font	Draft	Draft Banking	Roman	Sans Serif	Courier	Bold	Prestige	Script	Orator	Orator-S	Gothic	OCR-A	OCR-B
CP 923 (equivalent to ISO 8859-15)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❶
ISO 8859-1 Latin 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❶
ISO 8859-2 Latin 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❸	❶
ISO 8859-5 Cyrillic	✓	✓	✓	✓	✓	✓	❶	❶	❶	❶	❶	❸	❶
ISO 8859-7 Greek	✓	✓	✓	✓	✓	✓	❶	❶	❶	❶	❶	❸	❶
ISO 8859-8 Hebrew	✓	✓	✓	❶	❶	❶	❶	❶	❶	❶	❶	❸	❶
1250 Windows Latin2	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
1251 Windows Cyrillic	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
1252 Windows Latin1	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
1253 Windows Greek	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
1254 Windows Latin5	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
1255 Windows Hebrew	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
1256 Windows Arabic	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
1257 Windows Baltic Rim	✓	✓	✓	–	–	–	–	–	–	–	–	–	–

The printer is released by German "Bundesdruckerei" with the fonts Gothic and OCR-B in 10cpi.

C Emulations

When a printer understands the control set written for another printer type, it is said to emulate the other printer. Your printer emulates, i.e. “understands” the Olivetti PR2, the Epson and the IBM emulation in its standard version.

Escape sequences

Escape sequences or control codes tell the printer that the following transmitted code is a printer command and not a printable character. They allow the selection of printer functions or the changing of printer parameters from the computer. By transmitting an escape sequence, you are able to change the previously set configuration of the printer (e.g. character set).

This chapter contains an introduction into the sequences and control codes which are used by your printer.

The settings made by escape sequences have priority over the settings made in menu mode; therefore they override these.

What are escape sequences?

An escape sequence consists of an ESCape control character (ESC = decimal 27 or hexadecimal 1B) followed by one or more characters, which represent commands to the printer. Please note that this escape character has nothing to do with the ESC key on your computer keyboard.

For example, the control character ESC followed by the character "4" tells your printer to print the subsequent text in italics.

Control codes

Control codes give simple instructions to the printer to perform a specific function. Unlike escape sequences, control codes do not begin with the ESC control code. Instead, they consist of special single-character non-printing commands (e.g. LF, FF, DC2).

How are escape sequences used?

Escape sequences are transmitted to the printer by your computer software via the printer driver. Experienced users and programmers can also control the printer directly via control sequences, however before you start working with escape sequences and control codes, we recommend that you study the computer software manual.

To enter control codes the Ctrl key and an ASCII character must be pressed simultaneously. For instance, by pressing Ctrl and J a line feed is accomplished (it is required to output the character string on the printer). More information concerning this topic is contained in your computer software manual and the corresponding Programmer's Application Manuals (stored in the MISC folder of this CD-ROM).

The selected emulation must correspond to the printer driver of your application program. Settings caused by ESC sequences remain valid, until they are switched off by another control code. All settings are reset to the original menu, when the printer is switched off.

List of available control codes

The following table shows the available sequences in the various emulations.

If you want to know more about control codes, we recommend our Programmer's Application Manual on this CD-ROM. Detailled information on PR2 control codes can be found in the original PR2 programmer's manual.

PR2 mode

Command sequence	Function
Page Layout	
ESC Q nnn mmm ESC Z	Define document length
ESC J nnn	Define left margin
ESC T nnn	Define top of form " TOF"
ESC M nnn	Define bottom of form "BOF"
ESC & nn	Elementary vertical spacing
Print Pitches	
ESC <	Print pitch 10 cpi
ESC =	Print pitch 12 cpi
ESC >	Print pitch 166 cpi
ESC a n	Print pitch
ESC ?	Proportional spacing
Print Attributes	
ESC R nnn	Select graphic font
ESC 3	Double width
ESC 4	Cancel double width
ESC d	Double height and double width
ESC e	Cancel double height and double width
ESC ! W 1	Double height
ESC ! W 0	Cancel double height
ESC ! sp nnn	Add columns to the right of the character
ESC (	Bold face
ESC)	Cancel bold face
ESC * n	Underline
ESC +	Cancel underline

Command sequence	Function
ESC ` n	Superscript - Subscript
ESC {	Cancel superscript-subscript
ESC S 5	Select printer device
LF	Line feed forward
FF	Form feed (ejection from rear)
CR	Carriage return
BS	Back Space
ESC 7	Line feed back
ESC H nnn	Set absolute horizontal position
ESC I nnn	Set relative vertical position
ESC L nnn	Set absolute vertical position
ESC O	Eject document
ESC ^ 0	Change emulation
ESC [nnn	Select character set
BEL	Bell
DEL	Clear print memory
ESC # n	Assign reference for ESC L nnn
ESC | A nnn	Define offset in elementary steps
ESC | B nnnn	Define document width in elementary steps
ESC ' n	Set up document type
ESC / m nnnn	Absolute vertical position in elementary steps
ESC -	Measure document length
ESC } -	Measure document width
ESC S nnnn	Measure document length or width : answer
Graphics	
ESC 1 p mmmm nnn	9 pin BIM print
ESC 1 P mmmm nnn	24 pin BIM print
ESC 2	Reset BIM mode
ESC X nnn	Set relative horizontal position
Downline Loading Characters (DLL)	
ESC h 0 n m d0 d1 d2 D1 D2Dm	9 pin DLL
ESC h 0 n m d0 d1 d2 D1 D2Dm	24 pin DLL

Command sequence	Function
ESC : 000	Copy character generator into user memory
ESC m n 0	Select character generator
ESC Z	Request for primary ID
ESC / /	Printer ID
ESC i	Request for basic machine configuration
ESC p x y z k	Printer configuration
ESC j	Status request
ESC r x	Synchronous basic machine status
ESC sp B	Request for Document Status
ESC B id m ESC Z	Synchronous Document Status
ESC sp b	Request for FW Release ID
ESC b idrel1;idver1; ... idreln;idvern ESC Z	FW Release ID
ESC sp a	Request for Set-Up configuration
ESC a byte1 byte2 byte3 byten ESC Z	Set-Up configuration
ESC l	Reset error
ESC n	Olivetti controlled selection
ESC 0	General reset
ESC U n	Book operator
ESC r x	Answer to book operator command
ESC	Select automatic operator booking
ESC _	Select manual operator booking
ESC ! G n	Select 9 or 24 pin graphics and DLL
ESC [c 19	Programming Display command
ESC [c ETX	Cancel Programming Display command
Magnetic Device Control	
ESC]	Passbook magnetic stripe read
ESC t datiGS	Data to be recorded on the magnetic stripe
ESC \	Record and verify magnetic stripe
ESC Y E k1 K2	Set horizontal magnetic device
ESC Y B k1 K2	Set MICR Magnetic Read
Bar Code Print	
ESC x mm; hh; zz; n ESC Z	Set Bar Code Print

Command sequence	Function
ESC y dati ESC Z	Activate Bar Code Print
ESC } +	Form position control
ESC } L t nnn	Passbook positioning
ESC } M nnn	Negative bottom of form
ESC } W	Wait for end of print
ESC } 0 P	Reset form parking
ESC s nnnn	Measure form position : answer

PR50 mode

Command sequence	Function
Page Layout	
ESC Q nnn mmm ESC Z	Define document length
ESC J nnn	Define left margin
ESC T nnn	Define top of form " TOF"
ESC M nnn	Define bottom of form "BOF"
ESC & nn	Elementary vertical spacing
Print Pitches	
ESC <	Print pitch 10 cpi
ESC =	Print pitch 12 cpi
ESC >	Print pitch 166 cpi
ESC ?	Proportional spacing
Print Attributes	
ESC R nnn	Select graphic font
ESC 3	Double width
ESC 4	Cancel double width
ESC d	Double height and double width
ESC e	Cancel double height and double width
ESC (	Bold face
ESC)	Cancel bold face
ESC * n	Underline
ESC +	Cancel underline
ESC ` n	Superscript - Subscript
ESC {	Cancel superscript-subscript
ESC S 5	Select printer device
LF	Line feed forward
FF	Form feed (ejection from rear)
CR	Carriage return
ESC 7	Line feed back
ESC H nnn	Set absolute horizontal position
ESC I nnn	Set relative vertical position
ESC L nnn	Set absolute vertical position

Command sequence	Function
ESC O	Eject document
ESC ^ 0	Change emulation
ESC [nnn	Select character set
BEL	Bell
DEL	Clear print memory
ESC # n	Assign reference for ESC L nnn
ESC | A nnn	Define offset in elementary steps
ESC | B nnnn	Define document width in elementary steps
ESC ' n	Set up document type
ESC / m nnnn	Absolute vertical position in elementary steps
ESC -	Measure document length
ESC } -	Measure document width
ESC S nnnn	Measure document length or width : answer
Graphics	
ESC 1 p mmmm nnn	9 pin BIM print
ESC 2	Reset BIM mode
Downline Loading Characters (DLL)	
ESC h 0 n m d0 d1 d2 D1 D2Dm	9 pin DLL
ESC : 000	Copy character generator into user memory
ESC m n 0	Select character generator
ESC Z	Request for primary ID
ESC / /	Printer ID
ESC i	Request for basic machine configuration
ESC p x y z k	Printer configuration
ESC j	Status request
ESC r x	Synchronous basic machine status
ESC sp B	Request for Document Status
ESC l	Reset error
ESC n	Olivetti controlled selection
ESC 0	General reset
ESC U n	Book operator
ESC r x	Answer to book operator command

Command sequence	Function
ESC	Select automatic operator booking
ESC _	Select manual operator booking
ESC [c 19	Programming Display command
ESC [c ETX	Cancel Programming Display command
Magnetic Device Control	
ESC]	Passbook magnetic stripe read
ESC t datiGS	Data to be recorded on the magnetic stripe
ESC \	Record and verify magnetic stripe
ESC Y E k1 K2	Set horizontal magnetic device
ESC Y B k1 K2	Set MICR Magnetic Read
External paper handling device control	
ESC } +	Form position control
ESC } L t nnn	Passbook positioning
ESC } M nnn	Negative bottom of form
ESC } W	Wait for end of print
ESC } 0 P	Reset form parking
ESC s nnnn	Measure form position : answer

PR2845 mode

Command sequence	Function
Page Layout	
ESC Q nnn mmm ESC Z	Define document length
ESC J nnn	Define left margin
ESC T nnn	Define top of form " TOF"
ESC M nnn	Define bottom of form "BOF"
ESC & nn	Elementary vertical spacing
Print Pitches	
ESC <	Print pitch 10 cpi
ESC =	Print pitch 12 cpi
ESC >	Print pitch 166 cpi
ESC ?	Proportional spacing
Print Attributes	
ESC R nnn	Select graphic font
ESC 3	Double width
ESC 4	Cancel double width
ESC d	Double height and double width
ESC e	Cancel double height and double width
ESC (	Bold face
ESC)	Cancel bold face
ESC * n	Underline
ESC +	Cancel underline
ESC ` n	Superscript - Subscript
ESC {	Cancel superscript-subscript
ESC S 5	Select printer device
LF	Line feed forward
FF	Form feed (ejection from rear)
CR	Carriage return
ESC 7	Line feed back
ESC H nnn	Set absolute horizontal position
ESC I nnn	Set relative vertical position
ESC L nnn	Set absolute vertical position
ESC O	Eject document
ESC ^ 0	Change emulation
ESC [nnn	Select character set

Command sequence	Function
BEL	Bell
DEL	Clear print memory
ESC # n	Assign reference for ESC L nnn
ESC | A nnn	Define offset in elementary steps
ESC | B nnnn	Define document width in elementary steps
ESC ' n	Set up document type
ESC / m nnnn	Absolute vertical position in elementary steps
ESC -	Measure document length
ESC } -	Measure document width
ESC S nnnn	Measure document length or width : answer
Graphics	
ESC 1 p mmmm nnn	9 pin BIM print
ESC 2	Reset BIM mode
Downline Loading Characters (DLL)	
ESC h 0 n m d0 d1 d2 D1 D2Dm	9 pin DLL
ESC : 000	Copy character generator into user memory
ESC m n 0	Select character generator
ESC Z	Request for primary ID
ESC / /	Printer ID
ESC i	Request for basic machine configuration
ESC p x y z k	Printer configuration
ESC j	Status request
ESC r x	Synchronous basic machine status
ESC sp B	Request for Document Status
ESC l	Reset error
ESC n	Olivetti controlled selection
ESC 0	General reset
ESC U n	Book operator
ESC r x	Answer to book operator command
ESC	Select automatic operator booking
ESC _	Select manual operator booking
ESC [c 19	Programming Display command
ESC [c ETX	Cancel Programming Display command
Magnetic Device Control	
ESC]	Passbook magnetic stripe read

Command sequence	Function
ESC t datiGS	Data to be recorded on the magnetic stripe
ESC \	Record and verify magnetic stripe
ESC } r	MICR magnetic read
ESC Y E k1 K2	Set horizontal magnetic device
ESC Y B k1 K2	Set MICR Magnetic Read
External paper handling device control	
ESC } +	Form position control
ESC } L t nnn	Passbook positioning
ESC } M nnn	Negative bottom of form
ESC } W	Wait for end of print
ESC } 0 P	Reset form parking
ESC s nnnn	Measure form position : answer
PR2845 unique commands	
HT	Horizontal Tab
SO	Select second page of character set
SI	Select first page of character set
ESC V	Switch console LED on/off(NOP)
ESC W	Partially eject document

IBM mode

Command sequence		Functions
Horizontal position control		
BS	08H	Backspace
HT	09H	Horizontal tab
CR	0DH	Carriage return
ESC BS	1BH 08H	Backspace
ESC HT	1BH 09H	Horizontal tab
ESC CR	1BH 0DH	Carriage return
ESC D	1BH 44H	Set horizontal tabs
ESC X	1BH 58H	Set horizontal margins
ESC d	1BH 64H	Relative mode inline forward
Vertical position control		
LF	0AH	Line feed
VT	0BH	Vertical tab
FF	0CH	Form feed
ESC LF	1BH 0AH	Line feed
ESC VT	1BH 0BH	Vertical tab
ESC FF	1BH 0CH	Form feed
ESC 0	1BH 30H	Select 1/8” line spacing
ESC 1	1BH 31H	Select 7/72” line spacing
ESC 2	1BH 32H	Start text line spacing
ESC 3	1BH 33H	Set graphics line spacing
ESC 4	1BH 34H	Set top of form
ESC 5	1BH 35H	Automatic line feed
ESC A	1BH 41H	Set text line spacing
ESC B	1BH 42H	Set vertical tabs
ESC C	1BH 43H	Set form length in lines
ESC C 0	1BH 43H 00H	Set form length in inches
ESC J	1BH 4AH	Graphics variable line spacing
ESC N	1BH 4EH	Set automatic perforation skip
ESC O	1BH 4FH	Cancel automatic perforation skip
ESC [\	1BH 5BH 5CH	Set vertical units

Command sequence		Functions
ESC]	1BH 5DH	Reverse line feed
SO	0EH	Double-wide printing by line
SI	0FH	Condensed printing
DC2	12H	Select 10 cpi
DC4	14H	Cancel double-wide printing by line
ESC SO	1BH 0EH	Double-wide printing by line
ESC SI	1BH 0FH	Condensed printing
ESC DC2	1BH 12H	Select 10 cpi
ESC DC4	1BH 14H	Cancel double-wide printing by line
ESC -	1BH 2DH	Continuous underscore
ESC :	1BH 3AH	Select 12 cpi
ESC E	1BH 45H	Select emphasized mode
ESC F	1BH 46H	Cancel emphasized mode
ESC G	1BH 47H	Select double strike mode
ESC H	1BH 48H	Cancel double strike mode
ESC I	1BH 49H	Select print mode
ESC P	1BH 50H	Proportional space mode
ESC S	1BH 53H	Start subscript or superscript printing
ESC T	1BH 54H	Cancel subscript or superscript printing
ESC W	1BH 57H	Continuous double-wide printing
ESC [@	1BH 5BH 40H	Set presentation highlight
ESC _	1BH 5FH	Continuous oversore
ESC [I	1BH 5BH 49H	Set Font Global
Download and character code setting		
ESC 6	1BH 36H	Select character set 2
ESC 7	1BH 37H	Select character set 1
ESC =	1BH 3DH	Character font image download
ESC [T	1BH 5BH 54H	Set code page
ESC \	1BH 5CH	Print continuously from all character chart
ESC ^	1BH 5EH	Print single character from all character chart
Bitimage		
ESC K	1BH 4BH	Normal density bit image graphics

Command sequence		Functions
ESC L	1BH 4CH	Dual density bit image graphics
ESC Y	1BH 59H	Dual density bit image graphics
ESC Z	1BH 5AH	High density bit image graphics
ESC [g	1BH 5BH 67H	High resolution graphics
Barcode		
ESC [f	1BH 5BH 66H	Setup barcode parameter
ESC [p	1BH 5BH 70H	Set barcode data
Others		
BEL	07H	Beeper
DC1	11H	Select printer
DC3	13H	Deselect printer
CAN	18H	Cancel Data
ESC BEL	1BH 07H	Beeper
ESC DC1	1BH 11H	Select printer
ESC DC3	1BH 13H	Deselect printer
ESC CAN	1BH 18H	Cancel data
ESC Q	1BH 51H	Deselect printer
ESC R	1BH 52H	Set all tabs to power on settings
ESC U	1BH 55H	Set print direction
ESC [K	1BH 5BH 4BH	Set initial condition
ESC j	1BH 6AH	Stop printing
ESC [c 19	1BH 5BH 63H 13H	Programming Display command
ESC [c ETX	1BH 5BH 63H 03H	Cancel Programming Display command
AGM control command		
ESC *	1BH 2AH	Select Graphics Mode
ESC 3	1BH 33H	Set graphics line spacing (n/180”)
ESC A	1BH 41H	Set text line spacing (n/60”)
ESC J	1BH 4AH	Graphics variable line spacing (n/180”)
4722 unique command		
ESC [J	1BH 5BH 4AH	Set single line density
ESC [F	1BH 5BH 46H	Page Presentation Media
ESC [c	1BH 5BH 63H	Message

Epson mode

Command sequence		Function
Horizontal position control		
BS	08H	Backspace
HT	09H	Horizontal Tab
CR	0DH	Carriage Return
ESC $	1BH 24H	Set Absolute Print Position
ESC D	1BH 44H	Select Horizontal Tabs
ESC Q	1BH 51H	Set Right Margin
ESC \	1BH 5CH	Set Relative Print Position
ESC a	1BH 61H	Select Justification
ESC l	1BH 6CH	Set Left Margin
Vertical position control		
LF	0AH	Line Feed
VT	0BH	Vertical Tab
FF	0CH	Form Feed
ESC +	1BH 2BH	Select n/360” Line Spacing
ESC /	1BH 2FH	Select Vertical Tab Channel
ESC 0	1BH 30H	Select 1/8” Line Spacing
ESC 2	1BH 32H	Select 1/6” Line Spacing
ESC 3	1BH 33H	Set Graphics Line Spacing (n/180”)
ESC A	1BH 41H	Set n/60” Line Spacing
ESC B	1BH 42H	Set Vertical Tabs
ESC C	1BH 43H	Set Page Length in Lines
ESC C 0	1BH 43H 00H	Set Page Length in Inches
ESC J	1BH 4AH	Perform n/180-inch Line Feed
ESC N	1BH 4EH	Set Skip Over Perforation
ESC O	1BH 4FH	Cancel Skip Over Perforation
ESC b	1BH 62H	Select Vertical Tabs in Channels
ESC j	1BH 6AH	Perform Reverse n/180-inch Line Feed
Character attributes		
SO	0EH	Double-Wide Printing 1 Line
SI	0FH	Select Condensed Mode

Command sequence		Function
DC2	12H	Cancel Condensed Mode
DC4	14H	Cancel Double-Wide Printing 1 Line
ESC SO	1BH 0EH	Double-Wide Printing 1 Line
ESC SI	1BH 0FH	Select Condensed Mode
ESC !	1BH 21H	Master Select
ESC (-	1BH 28H 2DH	Select Score
ESC -	1BH 2DH	Auto Underscore
ESC 4	1BH 34H	Select Italic Mode
ESC 5	1BH 35H	Cancel Italic Mode
ESC E	1BH 45H	Select Emphasized Mode
ESC F	1BH 46H	Cancel Emphasized Mode
ESC G	1BH 47H	Select Double-strike Mode
ESC H	1BH 48H	Cancel Double-strike Mode
ESC M	1BH 4DH	Select 12 cpi
ESC P	1BH 50H	Select 10 cpi
ESC S	1BH 53H	Select Subscript or Superscript Printing
ESC T	1BH 54H	Cancel Subscript or Superscript Printing
ESC W	1BH 57H	Turn Double-wide Mode On/Off
ESC g	1BH 67H	Select 15 cpi
ESC k	1BH 6BH	Select Typestyle Family
ESC p	1BH 70H	Turn Proportional Mode On/Off
ESC q	1BH 71H	Select Character Style
ESC w	1BH 77H	Turn Double-high Mode On/Off
ESC x	1BH 78H	Select Letter Quality or Draft
ESC %	1BH 25H	Select User-defined Set
ESC &	1BH 26H	Define User-Defined Characters
ESC 6	1BH 36H	Enable Printable Characters
ESC 7	1BH 37H	Enable Upper Control Codes
ESC :	1BH 3AH	Copy ROM to RAM
ESC R	1BH 52H	Select an International Character Set
ESC t	1BH 74H	Select Character Table
ESC (t	1BH 28H 74H	Assign Character Table

Command sequence		Function
Bitimage		
ESC *	1BH 2AH	Select Graphics Mode
ESC ?	1BH 3FH	Reassign Graphics Mode
ESC K	1BH 4BH	Select Single-density Graphics Mode
ESC L	1BH 4CH	Select Double-density Graphics Mode
ESC Y	1BH 59H	Select High-speed Double-density Graphics Mode
ESC Z	1BH 5AH	Select Quadruple-Density Graphics Mode
Others		
BEL	07H	Beeper
DC1	11H	Select Printer
DC3	13H	Deselect Printer
CAN	18H	Cancel Line
DEL	7FH	Delete Character
ESC EM	1BH 19H	Set Auto Sheet Feeder Mode
ESC SP	1BH 20H	Set Inter Character Space
ESC #	1BH 23H	Cancel MSB Control
ESC <	1BH 3CH	Select Unidirectional Mode 1 Line
ESC =	1BH 3DH	Set MSB to 0
ESC >	1BH 3EH	Set MSB to 1
ESC @	1BH 40H	Initialize Printer
ESC U	1BH 55H	Turn Unidirectional Mode On/Off
ESC [c 19	1BH 5BH 63H 13H	Programming Display command
Download and character code setting		
ESC [c ETX	1BH 5BH 63H 03H	Cancel Programming Display command
ESC [n ! p	1BH 5BH n 21H 70H	Absolute vertical positioning (from the top)
ESC [n ! q	1BH 5BH n 21H 71H	Change between document and journal printing
ESC [n # p	1BH 5BH n 23H 70H	Relative vertical positioning backwards
ESC [n " p	1BH 5BH n 22H 70H	Absolute vertical positioning (from the bottom)
ESC [n # q	1BH 5BH n 23H 71H	Selection of type fonts/ character sets
ESC [n $ p	1BH 5BH n 24H 70H	Paper feed of the document
ESC [n1 .. n5 ! r	1BH 5BH n1 .. n5 21H 72H	Parameter block MSR
ESC [" r	1BH 5BH 22H 72H	Reading a MSR track

Command sequence		Function
ESC [# r STX .. ETX	1BH 5BH 23H 72H 02H...03H	Writing a MSR track
ESC [% r	1BH 5BH 25H 72H	Deleting a MSR track
ESC [n ! t	1BH 5BH n 21H 74H	Setting control points/initializing the control cycle
ESC [" t	1BH 5BH 22H 74H	Requesting the document width
ESC [# t	1BH 5BH 23H 74H	Document edge detection
ESC [n $ t	1BH 5BH n 24H 74H	Activating passbook processing
ESC [n % t	1BH 5BH n 25H 74H	Specification of the horizontal leading edge
ESC [n (t	1BH 5BH n 28H 74H	Mode switch-over for handling end of paper
ESC [n) t	1BH 5BH n 29H 74H	Setting control point II
ESC [n * t	1BH 5BH n 2AH 74H	Dual station control
ESC [n , t	1BH 5BH n 2CH 74H	Increasing the copying power
ESC [n ! z	1BH 5BH n 21H 7AH	Global printer status
ESC [" z	1BH 5BH 22H 7AH	Requesting special printer messages
ESC [n ; m " z	1BH 5BH n m 22H 7AH	Special printer messages
ESC [n # z	1BH 5BH n 23H 7AH	Requesting printing unit parameters
ESC [n1 ; ... ; n9 # z	1BH 5BH n1 .. n9 23H 7AH	Printing unit parameters
Additional commands		
ESC [m ; h ; z ; n * r STX (data) ETX	1BH 5B 3XH 3BH 3XH 3XH 3BH 3XH 3XH 3BH 3XH 2AH 72H 02H (data) 03H	Prints barcode according

D Interfaces

Your printer offers the possibility of operating either via a parallel, a serial or a USB interface. There is also a printer model with a second serial interface. This chapter informs you about the interfaces and describes the communication between your computer and the printer.

Interface settings for User 1 and User 2

Your printer allows you to set and use two independent menu configurations for the selection of the interfaces (User 1/User 2).

It is possible, to select different intefaces for User 1 and User 2 (e.g. User 1: serial interface and User 2: parallel interface).

It is also possible to select the same interface for User 1 and User 2. If so, any changes of the interface settings in menu mode (see *Menu, interfaces*, page 60) for User 1 will be transferred to User 2. In contrast thereto changes of the interface settings for User 2 will not be transferred to User 1.

If the parameter “Share User” in Setup mode is set to “Auto” (see *Share User*, page 57), the printer will handle print jobs for User 1 and User 2 automatically. (E.g. if a print job for User 2 interface is received the printer switches to User 2 and starts printing after a paper has been inserted.) If it is set to “Manual” after receiving a print job for User 1 or User 2 the respective **USER 1** or **USER 2 key** must be pressed to start the printout.

Parallel interface

The bidirectional parallel interface offers the so called “nibble” and the ECP mode of the IEEE1284 interface standard. This enables installation in accordance with Windows “Plug & Play”.

The standard parallel interface is able to transfer data at a speed of max. 30,000 bytes per second. When the receiving buffer is full, the data input is blocked until the data buffer is empty. This guarantees data transmission in blocks of 1 KB.

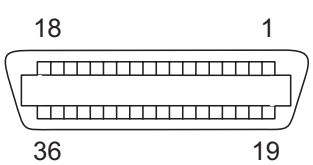
Connector assignment

Nibble Mode

Pin	Signal	In/Out	Pin	Parallel	In/Out
1	nSTROBE	In	19	Signal GND	
2	DATA0	In	20	Signal GND	
3	DATA1	In	21	Signal GND	
4	DATA2	In	22	Signal GND	
5	DATA3	In	23	Signal GND	
6	DATA4	In	24	Signal GND	
7	DATA5	In	25	Signal GND	
8	DATA6	In	26	Signal GND	
9	DATA7	In	27	Signal GND	
10	nACK	Out	28	Signal GND	
11	BUSY	Out	29	Signal GND	
12	PE	Out	30	Signal GND	
13	SELECT	Out	31	nINIT	In
14	nAUTOFEED	Out	32	nERROR	Out
15	NC		33	Signal GND	
16	Signal GND		34	NC	
17	Chassis GND		35	+5V DC	Out
18	+5V DC	Out	36	nSELECT IN	In

ECP mode

Pin	Signal	In/Out	Pin	Parallel	In/Out
1	HostClk	In	19	Signal GND	
2	DATA0	Bi-Di	20	Signal GND	
3	DATA1	Bi-Di	21	Signal GND	
4	DATA2	Bi-Di	22	Signal GND	
5	DATA3	Bi-Di	23	Signal GND	
6	DATA4	Bi-Di	24	Signal GND	
7	DATA5	Bi-Di	25	Signal GND	
8	DATA6	Bi-Di	26	Signal GND	
9	DATA7	Bi-Di	27	Signal GND	
10	PeriphClk	Out	28	Signal GND	
11	PeriphAck	Out	29	Signal GND	
12	nAckReverse	Out	30	Signal GND	
13	Xflag	Out	31	nReverseRequest	In
14	HostAck	In	32	nPeriphRequest	Out
15	NC		33	Signal GND	
16	Signal GND		34	NC	
17	Chassis GND		35	+5V DC	Out
18	+5V DC	Out	36	1284Active	In



Transmission length: max. 2.0 m

Serial interface RS232C

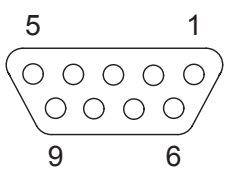
Your printer's serial interface supports the RS232C specification. The signals are received and transmitted by a 9 pin male connector.

Use a serial interface cable that meets the requirements of your host PC.

Type	RS232C interface
Synchronization	Asynchronous
Transmission rate	4,800 Baud to 38,400 Baud
Signal status	OFF (log.1) –3 V to –15 V ON (log. 0) +3 V to +15 V
Connection cable	up to 15 m length
Interface connections	ITT Cannon connector, series DB-9 S
Transmission protocol	XON/XOFF, READY/BUSY
Capacity of data buffer	32 KB

Connector assignment

Pin	Signal	Signal from	Ready/Busy	XON/XOFF
1	CD	Printer	—	—
2	TXD	Printer	Valid	Valid
3	RXD	PC	Valid	Valid
4	RTS	Printer	Invalid	Valid
5	Signal GND	—	Valid	Valid
6	DTR	Printer	Valid	Valid
7	DSR	PC	Valid	Valid
8	CTS	PC	Invalid	Valid
9	CI	—	—	—



Transmission length: max. 15 m

Serial attachment characteristics

Data rates

The interface supports the following data rates.

- 4800 bps
- 9600 bps
- 19200 bps
- 38400 bps

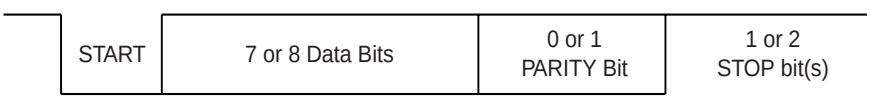
Supported protocols

This interface will also support the following:

- 7 or 8 Data Bits
- Even, Odd, None Parity
- 1 or 2 Stop Bit(s)
- Ready/Busy or XON/XOFF handshaking

Data Transfer

A data frame consists of a start bit, seven or eight data bits, 0 or 1 parity bit(s) and 1 or 2 stop bit(s). With these combinations, 9, 10, 11 and 12 bit frames are available:



Parity

There are three possible parity settings: Even, Odd, None.

- When **Even** parity is specified, the interface expects to receive data frames with even parity and will transmit data with even parity.
- When **Odd** parity is specified, the interface expects to receive data frames with odd parity and will transmit data with odd parity.
- Parity will be checked whenever **Even** of **Odd** parity is selected. If a parity error is detected, PARITY ERROR message will be displayed on the LCD. Printer will continue to receive data.
- When **None** parity is specified, the interface does not accept data frames to include a parity bit, and the interface transmits data without parity bits.

Handshake

Handshaking in the serial environment is most commonly handled by software and/or hardware. The manipulation of the hardware handshaking is handled by the following 4 lines:

- RTS (Request to Send)
- CTS (Clear to Send)
- DSR (Data Set Ready)
- DTR (Data Terminal Ready)

Ready/Busy (Hardware Handshake)

When Ready/Busy protocol is selected, DTR will be used to pace the data flow from PC. When the serial interface is BUSY (Buffer is full, Printer is out of paper or an error is detected), DTR will be dropped to indicate to PC that Printer cannot receive any more data.

XON/XOFF (Software Handshake)

When XON/XOFF protocol is selected, Printer indicates to PC that it is busy and not ready to receive any more data by sending an XOFF (DC3 X'13') character. When the serial interface is ready to receive more data, an XON (DC1 X'11') will be transmitted.

Configuring the serial interface of the PC

DOS mode/Command line

To use the serial interface of your PC, you must add the following mode commands to the AUTOEXEC.BAT file:

```
mode com1:9600,n,8,1,p
mode lpt1:= com1:
```

With the first MODE command, you configure the serial interface Com1 of your PC to the printer's factory defaults. The second MODE command redirects the parallel standard output port LPT1 of your PC to Com1.

Transmission rate: 9600 bauds
Parity: none
Data bits: 8
Stop bits: 1

These settings must be modified to use different values.

Windows 95/98

Click on the **Start** button in the Windows taskbar. Move the mouse to **Settings** and click on **Control Panel**. Click on **System**, followed by **Device Manager**. Click on **Ports**, **COM1** and **Port Settings**.

Bits per second: 9600 bauds
Data bits: 8
Parity: none
Stop bits: 1

These settings must be modified to use different values.

Windows 2000/XP

Click on the **Start** button in the Windows taskbar. Click on **Printers** (Windows 2000) or on **Printers and Faxes** (Windows XP) to open the printer folder. In the menu bar, click on **File** and **Server Properties**. Click on **Ports**, then select **COM1** and click on **Configure**.

Bits per second: 9600 bauds
Data bits: 8
Parity: none
Stop bits: 1

These settings must be modified to use different values.

USB interface

The USB (Universal Serial Bus) interface has the following features:

- Full compliance with the Universal Serial Bus Specification Revision 2.0 for Full Speed Mode.
- USB Function Controller with two FIFO-based Endpoints:
  One bidirectional Control Endpoint 0 (8 bytes)
  One receive Endpoint 1 (1*64 bytes)
- The signaling bit rate is 12 MB/s (Full speed).

E Consumables and accessories

Consumables

Only use ribbon cassettes from the manufacturer as products from other manufacturers may damage the print head or the ribbon drive.

Consumables	Order no.
Ribbon in recyclable cassettes, color: black	043393

Accessories

Only use print heads that are approved to prevent damage to your printer.

Accessories	Order no.
Print head 24 needles	400805
Serial interface cable (5 m)	043018

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